

Vol. 6 . No. 10



LONDON GUARANTEE BUILDING Avenue at Wacker Drive THE HOME OF Michigan

#### finish

MONTHLY TRADE PUBLICATION Established January, 1944
Published by DANA CHASE PUBLICATIONS

360 North Michigan Avenue Chicago 1

Telephone CEntral 6-1229

Telephone CEntral 6-1229

A trade publication devoted to the interests of the manufacturers of major home appliances and allied metal products. Covers plant facilities and manufacturing problems from raw metal to finished product, with special emphasis on metal finishing. Free controlled circulation to management, purchasing, engineering and key plant personnel in companies inimately connected with the field covered. To others, subscription price (U.S. funds) \$5.00 per year. Foreign subscription price (U.S. funds) \$5.00 per year. Editor and publisher. Dawa Chass.

Editor and publisher, Dana Chase.
Associate editors, Prof. A. I. Andrews,
Prof. R. M. King, and Matt E.
HEUERTZ.

HEUERTZ.
Acceptance under the act of June 5, 1934, at Aurora, Illinois, authorized January 7, 1948.
COPYRICHT 1949
DANA CHASE PUBLICATIONS
PRINTED IN U.S.A.

PORCELAIN ENAMEL ANSWERS DESIGN PROBLEMS FOR WALL-TYPE SPACE HEATERS By Al Duim and Duane Beck 17
FORTY YEARS OF PROGRESS IN ELECTRIC RANGE PRODUCTIONBy James J. Nance H-4
STANDARDIZATION FOR MASS PRODUCTION By J. C. Sharp H-9
A PROGRESSIVE SALES PROGRAM IS THE KEY TO VOLUME PRODUCTIONBy Fred J. Walters H-11
FABRICATING THE PARTS FOR THE HOTPOINT RANGEBy B. E. Schroeder and M. E. Maurer H-21
A MODERN FINISHING PLANT FOR ELECTRIC RANGES
HANDLING, CRATING AND SHIPPING FOR SAFE DELIVERY. By John G. Borson and Edward Zelinski H-49
NATIONAL SAFE TRANSIT PROGRAM ROUNDS OUT ONE YEAR OF OPERATION

#### **Features**

THE FINISH LINE — An Editorial	15
FLOW CHART FOR THE WORLD'S LARGEST RANGE PLANT	H-30 & H-31
A CONTRAST — 1909 and 1949	H-56 & H-60

#### Industrial News

PORCELAIN ENAMEL INSTITUTE FORUM	20	21
INDUSTRY NEWS AND PERSONALS		 83
SIX THOUSAND EXPECTED AT AGA CONVENTION IN CHICAGO		 84

#### Miscellaneous

ADVERTISERS'	INDEX			 			 						 			 			104	1
CLASSIFIED A	DVERTISI	NG		 			 						 			 			104	ı

FROM RAW METAL TO FINISHED PRODUCT



There are two ways you can increase the sales of your product; by price cutting or by improving quality. But price cutting lowers the prestige of the product... people don't like to think they're not getting the best. By improving the quality of your product you give the consumers what they want and compete on equal footing with the biggest manufacturers. Start using Porcelain Enamel, and when you do, let everyone know—it's a wonderful selling point!

and new for many years.

We want to work and plan with you to give your product an economical Porcelain Enamel finish. Take advantage of long years' experience, new equipment and skilled engineers. Send us blueprints or

Plan... for the Lifetime Finish

a sample for a prompt quotation.

They pick Porcelain Enamel because it stands more wear and tear, doesn't scratch or stain, looks bright

#### VITREOUS STEEL PRODUCTS INC.

BOX 1791, CLEVELAND 5, OHIO (Factory at Nappanee, Ind.)

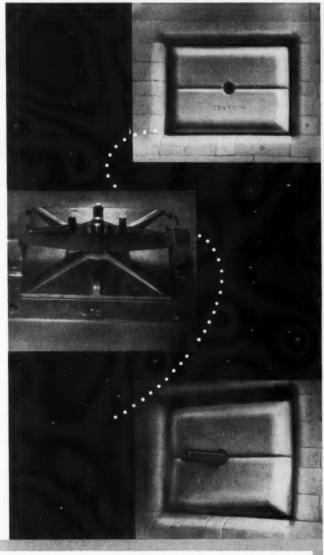
## MCDANEL MILL HEAD ASSEMBLIES GUARD BATCH

from charge Tap

Complete purity of batch is obtained through use of McDanel Mill Head Assemblies. Their construction includes an overhanging type door frame, brick and door block that cover all metal parts. No contamination from iron is possible at any time.

Photo A shows interior view. Simply charge mill, close mill head and insert grinding plug (Photo B). When grinding is completed, the mill door is *left in place*, which avoids dislodging partially ground material around the head. The perforated plug (C) is substituted for grinding plug and the mill is quickly and easily discharged. At no time can batch be exposed to metal.

Specify McDanel Mill Head Assemblies for purity and uniformity of batch and long, efficient service.



#### . HAND ROLLED GRINDING BALLS

Made from specially developed vitreous porcelain body and hand rolled for faster, uniform grinding. Mill tested and individually inspected before shipment to you.

#### . MILL LINING BRICK

Low in glass content, McDanel Mill Lining Brick gives maximum resistance to wear and long, satisfactory service. Complete size range to fit every size mill:

#### \* MILL HEAD ASSEMBLIES

Be sure to specify McDanel Mill Head Assemblies on your new mills. No metal can contaminate your mill charge with these patented covers. They are tops for uniformity of batch and long service.

#### . METAL COVERED GRINDING JARS AND MILLS

Protected with heavy gage steel jacket McDanel Metal Covered Grinding Jars and Mills are easy to handle, easy to clean, discharge rapidly and stand up under long usage.

MAKERS OF THE
Original HAND-ROLLED
GRINDING BALL

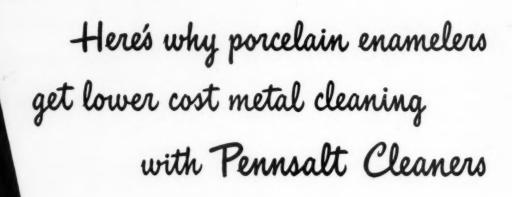


West Coast Representative
Fernholtz Machinery Co., 150 N. Norton Ave., Los Angeles, Calif.

McDANEL REFRACTORY PORCELAIN CO.

Chicago Vitreous Enamel Product Company

Exclusive Representative for the Enameling Industry



1. BASIC PRODUCTION—Right from the ground up, Pennsalt manufactures metal cleaners. At every step, only the best ingredients are used . . . many direct from Pennsalt-owned deposits. That assures you quality products

2. SCHMIFIC RISEARCH — At Pennsalt's modern Whitemarsh Research Laboratories, chemists are constantly working to prepare even better and more efficient ways of processing Pennsalt Metal Cleaners. And the savings in cost are passed on to you!



PENNSALT 34

**Corrosion-Resistant Paints** 

FOUR good reasons why more and more porcelain enamelers are calling in Pennsalt to help them lower cleaning costs prior to enameling. You save TWO ways: Production is uninterrupted by rejects due to cleaning: long-lasting anhydrous Pennsalt Cleaners reduce the need for recharging. Investigate Pennsalt Metal Cleaners today! It pays! Write: Special Chemicals Division, Pennsylvania Salt Manufacturing Company,



PENNSALT 37 • PENNSALT 45X • PENNSALT 45X-2 • PENNSALT 30 • PENNSALT EC-12

and Cements • Muriafic Acid • Anhydrous Hydrofluoric Acid • Sulfuric Acid • Sal Ammoniac

# CENTURY NOW OFFERS a complete customer FIELD SERVICE • • •



Harry Sirovy, Century sales manager, confers with three of the new customer field service staff. Clockwise in the photo, they are Harry Sirovy, Ferd Rozene, Ernest Banse and Elliott Peterson. These men, together with Howard Lennox, represent a combined experience of 84 years of practical enamel plant operation.

TOPPING almost 20 years of serving leading porcelain enameling plants with quality frits of all types, Century now offers a complete customer field service.

This new service is headed by F. W. "Ferd" Rozene, well known to the industry as a practical enameler with 23 years' experience as head of the porcelain enameling plant of one of the leading stove manufacturers.

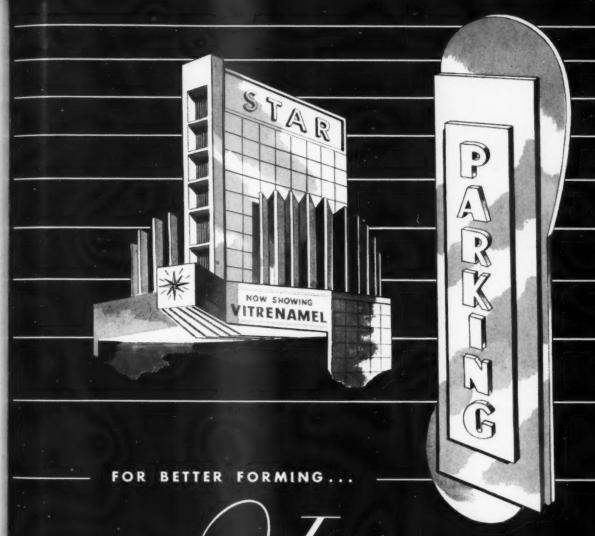
With Rozene in Century's new customer field service department are three key men from his enameling plant, experienced practical enamelers who are specialists in pickling, milling, dipping, spraying, firing — in fact, all important operations in an enameling plant. These four men form a team of experts, the nucleus of a complete field service organization.

All of these men have been using Century frits for years. They know the characteristics which make

Century frits the best buy in porcelain enamels today. They can provide these same advantages in your plant if given the opportunity.

This new field service is immediately available to all Century customers. Be one of the first to receive its benefits.





## (Uss) /itrenamel

• In U·S·S Vitrenamel, enamelers have found the ideal base metal for all porcelain enameling jobs. Vitrenamel is consistently uniform in composition, surface finish, and forming qualities.

For dependable steel sheets, for an increased percentage of OK's on the inspection line, specify U·S·S Vitrenamel porcelain enameling sheets by name. For complete information, write to the U·S·S office nearest you.

CARNEGIE ILLINOIS STEEL CORPORATION PITTSBURGH AND CHICAGO
COLUMBIA STEEL COMPANY. SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

### PORCELAIN ENAMEL INSTITUTE, INC.

1010 VERMONT AVE. N. W., WASHINGTON 5, D. C.

Welcome to P. E. I. Membership



If you operate a porcelain enameling plant in any country you should belong to the P. E. I.

Operators of porcelain enameling plants in any country can benefit from membership to an extent far beyond the modest membership fee.

Plant operators in the U.S.A. who have enameling facilities should consider P.E.I. membership a must — for the benefits it offers to management, sales and advertising departments, and plant operating men. Facts on enamel processing, market information and selling methods are yours, as a member.

It will pay you to "join up." Apply now for membership.



(0B) 5000 mg

100 John 100



# Some things just can't be neglected!

#### .... BE SURE YOU'RE BUYING

#### THE BEST FRITS ...

Many decisions can be delayed, set aside, put off, or even forgotten without serious repercussions . . . but . . . other things just can't be neglected—buying the best frits, Hommel Frits, is one of them! It's your key to bigger profits.

It is a simple matter to be certain you're buying the best frits.

Write, wire—phone for a Hommel Service Engineer today.

#### CHECK THIS LIST AND YOU'LL KNOW WHY HOMMEL FRITS ARE YOUR CHOICE FOR THE BEST—

- Lower production costs
- Sales appeal finish
- Uninterrupted production
- Superior research facilities to maintain high quality standard
  - Constant customer satisfaction
  - Specialized experience to meet your exact needs
    - Customer counseling advice
      - Prompt shipments

BURGH 30, P Pocific Coast Agents H. BUTCHER CO.

#### Laboratory Controlled Production of Ceramic Supplies

- .
- FRIT for Steel, Cast Iron or Pottery
- · CERAMIC COLORS
- CHEMICALS
- BRONZE POWDERS
- METAL POWDERS
- SUPPLIES
- . EQUIPMENT

Our Technical Staff and Samples are available to you without obligation. Let us help you with your problems.

World's Most Complete Ceramic Supplier

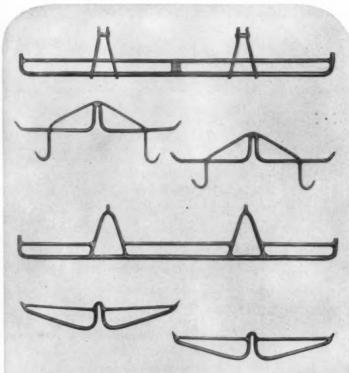
## "Lo-74i" p74 ....

fastest . . . . most economical . . . . most positive surface preparation of enameling iron for ground coat . . . . doing away with repickling . . . . Have the NORTHWEST man in your territory tell you how you can restore better than pre-war efficiency . . . . or write us direct.



# Burning tools that hold up your ware ...not your production





#### WITH KLAAS MACHINE AND MANUFACTURING CO., TOO ... IT'S INCONEL FOR BURNING TOOLS

The enameling burning tools shown above were fabricated by Klaas from welded Inconel mill forms.

Like other leading fabricators of furnace fixtures, this company chose Inconel as the standard metal for their stock and special items.

If you contemplate retailing or building new furnace equipment, the Klaas Machine and Manufacturing Company offers you the benefits of wide experience in both design and fabrication.

For quotations and design recommendations, submit sketches and requirements to:

KLAAS MACHINE AND MANUFACTURING COMPANY
4314 EAST 49th STREET
CLEVELAND 9. OHIO

If your furnace fixtures suffer from heat prostration, here's a quick way to make your production superintendent smile again...

Switch to Inconel\*.

This Nickel-Chromium alloy will give long service in high heat applications. It is rustproof, corrosion resistant, with exceptional red-heat strength. What's more, Inconel develops a tightly adhering oxide film that is highly resistant to spalling.

Inconel's superior hot strength permits lighter weight fixtures for the same load with consequent savings in fuel bills.

For further information about fabricated tools and fixtures of wrought Inconel write directly to the Klaas Machine and Manufacturing Company.



THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N.Y. \*Reg. U.S. Pat. Off.

INCONEL...for long life at high temperatures

Dry Acid Salt Compounds

#### PICKLING PRIOR TO PORCELAIN

SAFE — Eliminate acid tachoys — acid storage — acid mixing — and acid burn

Marely heat the water — add TROXIDE — and pickle the water

NON-FUMING — No fumes — no acid spray! Creates better and healthler working conditions — minimizes corrosion of auxiliary equipment.

NON-SCUMMING — Absence of sulfur fumes from pickle room eliminates a definition cause of scumming in the burning atmosphere and on finished ware.

FREE-RINSING — Leaves no objectionable films may be used with or without nicks immersion dips — easier to neutralize then conventional acids.

Manufactured by
the originators of
the originators of
Metal Cleaners

ANODEX

METEX

METALEX

ROCHELTEX

DYCLENE

DURODEX

CHROMETEX

VERSATILE— Easily controllable by temperature and concentration — produces any desired etch on conventional enameling irons — cold rolled steel — or the new alloyed enameling irons.

ECONOMIC — Resists buildup of desolved iron

— Outlast sulferic acid by wide margins — demands less maintenance of solution and equipment.

Write for Free Technical Bulletin "F-7"

\* Incorporated \*

Compounds and Equipment for Metal Finishing



ARE YOU READY—to take full advantage of a fall upswing in the market for appliances and other metal products? If your answer is "Yes" for the reasons that you have adequate supplies or sources for the raw materials and the labor required to produce the finished products then we would suggest that it isn't a very strong "yes."

Sure enough, you can ride with the tide and get a share of the expected total increase in product sales but that is not a sound answer to industry development.

orkin

nick

ature

y de

eling

nev

iro

mar

e 0

Admittedly, there is still a vast untapped market for home appliances and allied metal products that is at present in a semi-dormant state. Some manufacturers, but all too few, have made a genuine effort to get to this market by increasing sales effort and activity down through their own organizations and distributing channels to the retail level. Others have given excellent "lip service" to the job but have accomplished little. Choose your own classification.

The fact remains that there still is not nearly enough "shirt sleeve" selling at any level and we certainly haven't approached the desirable end result of having all good dealers employing sound sales programs. The era of "door-to-door" selling is certainly not back in its full glory — and until its return the full potential of an existing market can't possibly be touched.

But, you say, television is selling without door to door effort. When you start comparing the sales and marketing methods for an established home appliance such as a refrigerator, washing machine or kitchen range with a "new" source of entertainment such as television you make a mistake that will not improve the appliance picture. Just consider that every time you see a new aerial atop a home or apartment building it may mean that one of your fine products will not be sold there for some months to come. To attempt to stop the natural increase in interest and popularity of this "new" product would be like trying to reverse the flow of a river — a very discouraging job.

What you can do and should be doing more effectively is making sure that the story of your products and their importance to the ultimate user is being forcefully presented in the store and in the home. And to get the maximum immediate sales the story should be in the home before the television aerial goes up.



#### For the producing men

Now that we have "taken it out" on the salesman and sale's-management repeatedly let us see what the plant man can do. He can sit back and say the problem is now one of "selling" the product or he can wake up to the fact that the average metal product still has a long way to go. Certainly the "ultimate" has not been reached in design possibilities for greater beauty, efficiency and operating economy.

A special feature section in this issue shows the great strides that have been made during recent years in design standardization and mechanization in manufacture in connection with the mass production of one type of home appliance.

Not every company could or should plan an expansion and modernization program as extensive as the one described.

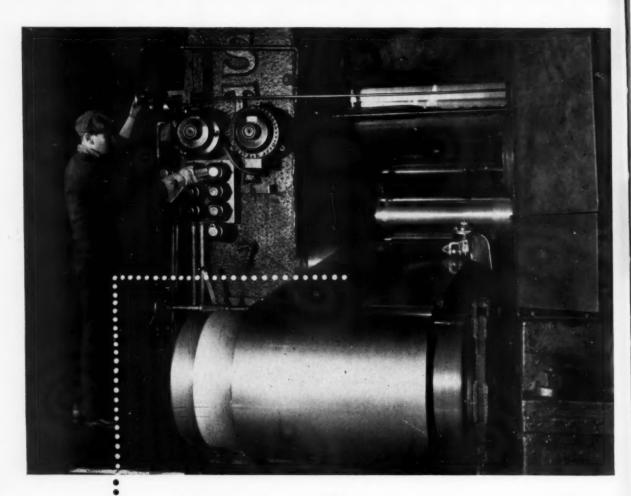
Every plant management *can* take advantage of modern methods, new materials and more efficient equipment in keeping with the size of the company.

It is true that there has been an unusual amount of plant modernization since the war but there are still many manufacturing plants employing equipment and methods that have been obsolete in the better managed plants for months or even years.

So, if you are responsible for engineering or production, we urge that you consider that while the salesman has a big job to do he can only do an effective job if the product which he has to sell is properly designed, soundly constructed and a true value in today's competitive market.

Dana Chase

EDITOR AND PUBLISHER



## Made Flat -- Stay Flat

You can be sure that Inland Enameling Iron Sheets will meet the requirements for flatness your products may demand. Rigid control assures this. The metal must be up to Inland's uniformly high standards before it leaves the open-hearth furnaces. It must be maintained at Inland's high standards as it is rolled, under constant tension, in modern rolling mills. It is especially processed to keep it free from internal strains. Continuous testing and inspection by experienced Inland metallurgists assure you of a uniformly high quality enameling iron sheet.

In addition, the use of Inland Enameling Iron Sheets produces better enameling results because of "double-tight" adherence, sag resistance, and correct chemical composition. We are striving to increase our production of these quality sheets in order to meet the unusual demand for them. INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.



### INLAND ENAMELING IRON SHEETS

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • PILING • FLOOR PLATE • RAILS • TRACK ACCESSORIES

## Porcelain enamel answers design problems of wall-type space heaters

By Al Duim . CHIEF ENGINEER, AND Duane Beck . PRODUCTION ENGINEER, MISSION APPLIANCE CORPORATION, HAWTHORNE, CALIFORNIA



For several months, Mission Appliance Corporation has been using a heating element in a new SUNAIR gas-fired space

heater. We turned to a high temperature ceramic coating, as have some other appliance manufacturers, because we discovered that it is the only finish which meets the several requirements of this particular type heating unit.

The use of porcelain enamels in the manufacture of appliances is not new. However, its use as a finish for . the heat radiating elements of a heater is a recent application, and the experience in this instance may well point the way to still other applications. Mission's SUNAIR is a vented circulator type wall heater. It may be installed in any wall of standard 2" x 4" construction where the overall wall thickness does not exceed 6". It fits between standard 16" centerline studs and is installed flush with the wall.

The heaters are made in five models. The difference in the models being whether one or two heating tubes are used, and whether it is a "single" or "dual" installation. The dual models provide a heating unit on each side of a wall so that two rooms may be heated from a single installation. These models are really two heaters back-to-back, and each unit operates independent of the other.

Because of the limitation of space, the heaters are narrow in width and shallow in depth. The SUNAIR stands 59½ inches overall. Although the narrow limitations added to the room-heating efficiency of the unit, they also presented several engineering problems.

#### Designing for space requirements

Among the problems was the fact that none of the commonly used heating elements could be fitted into the design. The heating elements had to be of extra length, they had to be placed vertical, and they had to be vented. Ventilation of the heater meant that a percentage of the heat would be carried out of the room through the vent. The heating elements had to be capable of delivering a minimum of 70% of their heat into the room to meet American Gas Association standards.



finish october . 1949



Al Duim

The solution of the heating element problem was a tube- or fluetype element. It is on these tubes that porcelain enamel has proven to be the best finish available.

The heating tubes in the unit are 3 inches outside diameter, and 42 3/16 inches long. They are fired from the bottom end by the enclosed gas flame. Fitted inside the tubes are a series of baffles which retard the upward progress of the heat so that it is radiated from the surface of the tubes, and also reflected into the room area by a curved metal surface in the back of the unit.

The design of the tubes and baffles, so far as the control of the speed and path of the heat travel is concerned, was but one problem. And it was the simplest problem. Finding a material which would meet the manufacturing, cost and physical requirements was our toughest problem.

From a manufacturing point of view, the material had to be one which was readily available, and one which could be fabricated with standard shop equipment and practices. The final cost of the tubes had to be low enough to permit us to make distribution in a very competitive market.

Physically, the tubes had to withstand the highly corrosive effects of the many different types of natural, manufactured, mixed, and liquified petroleum gasses supplied to consumers through the country. They had to withstand the scaling effect of intermittent firing at high temperatures, temperatures ranging up to 1150° F. They had to withstand the salt air conditions of the atmosprere of sea coast areas, and the highly humid conditions of other sections. They had to withstand excessive thermal shock to which they may be subjected in such home installations as in bathrooms where cold water may be splashed directly on the heated tubes.

To meet our own product standards, the tubes had to meet these requirements for a minimum of ten years. And they had to meet another requirement, one which we have always considered of great importance. That is the requirement of good appearance throughout the entire life of the appliance.

We conducted many experiments. Our final solution was the use of a high temperature ceramic finish on both tube and baffles.

#### Sheet steel selected

The tubes in the SUNAIR are made from standard 18-gauge cold rolled, mild steel. We favored the sheet stock over tubular stock because the material thickness was more uniform. We obtained a great-



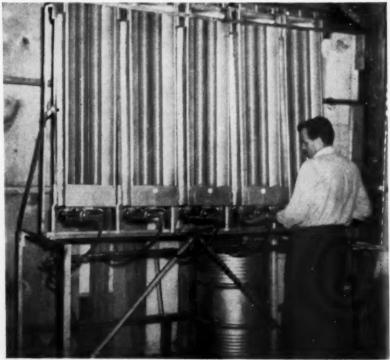
Duane Beck

er uniformity in size and shape by fabricating the tubes ourselves and doing it with a punch press die operation instead of a rolling operation. The edges are joined with a standard lock seam.

Uniformity, we discovered, is very important for several reasons. Variations in size and shape create problems in handling and in final assembly. Any fluting or flat spots, as may be experienced in rolling operations, threaten the adherence of the finish,

to Page 103 ->

Photo shows testing of the vented circulator-type wall heaters.



## STAMPINGS of Highest Quality Large or Small



Stampings of Washing Machine Lids for many nationally known washing machine manufacturers.



Designing and Stampings of Legs for 12 of today's most popular washing machines.

d

a-

n.

d

)-

1-

3,

ì,



All Steel Basement Windows designed, stamped, welded, finished and packed.



Produced on a Battery of Presses from 500-lbs. to 500-tons capacity

Complete Production of nationally used Highway Flares, including, stampings, testing and finishing.



A Packaged Unitstamped, assembled, finished and packed for shipment—is this popular tank heater.





Made to the highest precision standards, New Monarch stampings find a practical application in the improvement of a wide variety of quality items — from heaters to power scooters.

Regardless of whether your requirements are for the large, deep-drawn, intricate stampings or the smaller, simpler kinds, you'll find New Monarch fully equipped to handle your needs with utmost economy to you. Our presses range from 500-lbs. up to 500-tons capacity.

To further serve you, New Monarch offers you a Complete From-Blueprint-To-Shipping-Carton Service, including dies, jigs, fixtures, assembly and packing.

FOR FURTHER INFORMATION, WRITE NEW MONARCH TODAY.



When you think of Stampings, think of NEW MONARCH MACHINE & STAMPING CO. DES MOINES 9, IOWA

finish october . 1949

### PORCELAIN ENAMES

eleventh annual forum for plaen

(See November finish mp



#### MISTITUTE FORUM

plaen held at Ohio State University

ish mplete editorial coverage)





ALUNDUM Muffle Plates by Norton Company have been specified in Ferro Enameling Furnaces for more than a quarter of a century as essential equipment for quality enameling. Made of electrically fused alumina plus a highly refractory bond, ALUNDUM Muffles possess great refractoriness, chemical stability, physical strength and excellent heat transfer properties. Their strength permits thin cross-section for rapid passage of heat. They will give long, trouble-free service in either intermittent or continuous furnaces.

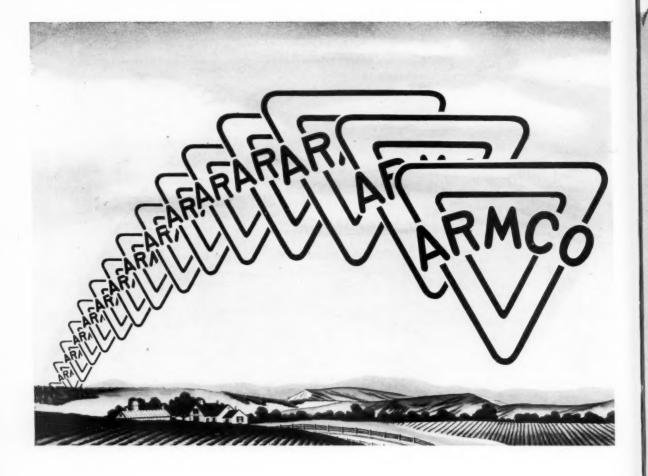
NORTON COMPANY, Worcester 6, Massachusetts

NORTON REFRACTORIES

## SPECIAL HOTPOINT SECTION

observing the 40th anniversary of the electric range

- I A MESSAGE FROM PRESIDENT NANCE
- II VICE PRESIDENT SHARP ON STANDARDIZATION
- III VICE PRESIDENT WALVERS ON MARKETING
- IV FABRICATING THE HOTPOINT RANGE
- V FINISHING THE HOTPOINT RANGE
- VI MATERIALS HANDLING, AND PACKAGING AND SHIPPING FOR SAFE DELIVERY



#### A mark of quality marches on

To EnameLers the world over, the familiar Armco trademark stands for:

- **1.** A highly refined and uniform enameling iron that helps them produce a consistently fine porcelain enamel finish at lowest possible cost.
- **2.** A research-minded company that has led the way in almost every major improvement in enameling iron for more than forty years.
- **3.** A service-minded company whose experienced technicians have worked closely with enamelers in solving their most difficult problems—problems that

often had nothing to do with the enameling stock.

**4.** A merchandising-minded company that has continuously advertised the benefits and advantages of porcelain enameled products in national consumer magazines for thirty-five years.

To Buyers of porcelain enameled products, the famous Armco trademark means "basic metal quality." When they see this distinctive mark on a porcelain enameled product, they know you have chosen the metal base with exacting care, and with an eye to giving them the most value for their money.

ARMCO STEEL CORPORATION





JAMES J. NANCE... PRESIDENT OF HOTPOINT, INC.



## Forty years of progress in electric range production

the story behind the world's largest range plant



BASED ON AN INTERVIEW WITH

#### James J. Nance · PRESIDENT, HOTPOINT, INC., CHICAGO

timed to match the rapidly rising curve of public acceptance that has made the growth of electrical cooking the outstanding event in the industry since the war. To further emphasize the advancements of the electric range industry, revolutionary pushbutton models were put into production at the plant's opening.

#### A \$50 million investment

Management's decision to undertake one of the most extensive expansion programs in the appliance industry came after many years' study of the potential market for electric ranges; at the same time studies were underway to expand production of automatic dishwashers, and electric water heaters. These were the products with the greatest future, our marketing people concluded. The new range plant represents the spearhead of this postwar expansion program, representing a total investment of \$50 million for new production facilities and operating capital.

For 40 years, the backbone of Hotpoint's business has been the electric range; for this reason, the major portion of the total investment in new facilities was allotted for a range plant that would give Hotpoint a production rate never before approached in a single factory. At the same time, the company acquired a new plant for mass production of dishwashers and electric water heaters.

Never before in the history of the appliance industry had there been such an accumulated and unfilled demand as that which existed immediately following the war years. It was a matter of the utmost urgency that Hotpoint's expansion be completed during this period of "economic sunshine."

Our engineering, production, and plant layout staffs rose to this challenge; I believe they did one of the outstanding jobs in American industry in erecting and placing in operation the new range plant. The factory was built, equipped and set in motion in the 15-month period allotted for this undertaking.

#### Rated plant capacity — 600,000 ranges a year

This plant is unusual in many respects. It has a rated cupacity of 600,000 ranges a year, a figure best visualized when it is pointed out that this nearly equals the 1941 output of the entire industry.

The range plant was opened formally in September, 1948, with push-button ranges coming off the assembly lines in a steadily increasing volume. This new manufacturing potentential, coupled with the upsurge in public acceptance for electric cooking, was dramatized recently when the two-millionth range was produced. It took 30 years for Hotpoint to make its first million ranges; yet the second million were produced in the last three years.

Construction of new physical facilities—the brick and mortar and steel and machinery—was merely one phase of "the greater Hotpoint program." To match this physical expansion, it was necessary to broaden our engineering, manufacturing and marketing departments. Particular emphasis was laid on expanding and refining our entire retail selling organization.

#### Four steps to meet

#### new marketing conditions

This called for an exhaustive analysis of new marketing conditions that faced the appliance industry following the war, which could be summed up in four categories:

1. Hotpoint had to greatly increase production capacity to maintain its

to Page H-13 →



The electric range industry dramatically became full grown just a year ago when Hotpoint's new plant was put into production.

The largest in the world, this plant placed the production of electric ranges on a completely automatic basis for the first time. The move to put this plant into operation was



# Hotpoint Switches to SPEED NUTS with Substantial Assembly Savings

Originally Hotpoint attached the lower section of its new automatic washer by means of a solid weld. Now we are using 12 Flat-Type SPEED NUTS to do the same job . . . with a substantial saving. The change also released welding equipment for other jobs and stepped up production by making a sub-assembly operation part of the final assembly, Hotpoint engineers report.

This is one of the many ways SPEED NUTS and

SPEED CLIPS help Hotpoint keep costs down and production up. See for yourself the thousands of unique, cost-saving fastening applications performed by the SPEED NUT brand of fasteners. Your Tinnerman representative will call at your convenience. He's listed in major city phone directories. Or write: TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.





## The ideal metal in <u>any</u> kitchen is **ALLEGHENY METAL**

Hotpoint

are enhanced by the bright, lasting beauty of Stainless Steel.



finish october . 1949

No other metal answers the demands of domestic or commercial kitchen service so perfectly as stainless steel.

That's because no other metal possesses stainless steel's combination of qualities to the same degree: its great strength, high resistance to heat, wear and corrosion, long-lasting beauty and easy sanitation. Modern kitchen ranges shine with Allegheny Metal—and everything else in the kitchen, too: work surfaces and cabinets, refrigerator trays and trim, sinks and utensils.

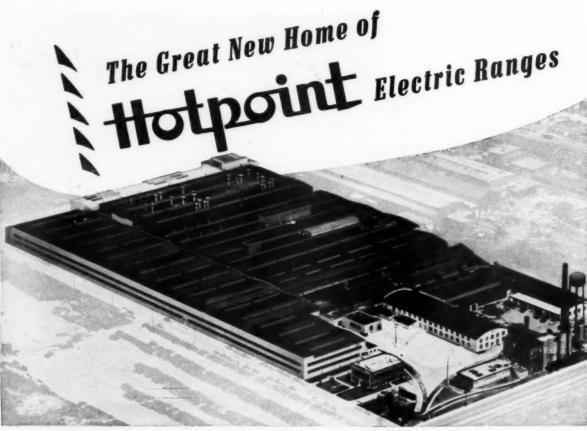
Both to the fabricator and user of kitchen equipment, the name "Allegheny Metal" means the pioneer stainless steel—backed by years of known quality and dependable uniformity. • Specify it for best results.



Nation's Leading Producer of Stainless Steels in All Torms



ALLEGHENY METAL is stocked by all Joseph T. Ryerson & Son, Inc. warehouses



# An Example of ABELL-HOWE'S Industrial Planning and Building

To solve Hotpoint's "housing problem," Abell-Howe designed and built the largest electric range plant in the world. Hotpoint's new home occupies eighteen and one-half acres of Chicago's southwest side. It contains one million square feet of floor space and seven miles of conveyors. Under its roof, four thousand workers can produce twelve thousand automatic electric ranges per week.

Yet it is not the bigness of the Hotpoint plant to which Abell-Howe architects and engineers point with pride. Rather it is the *smoothness* with which parts and sub-assemblies move from department to department and emerge, sparkling, complete ranges, on the loading platform. To attain this

smooth production flow, Hotpoint engineers, in collaboration with manufacturers of modern production machinery, have taken skillful advantage of the new plant's open, spacious interior, with its minimum of obstructions. The many types of Abell-Howe cranes used, for example, are located to keep raw materials and finished products moving on schedule, with no bottlenecks and with a minimum of cost.

Planning and building for smooth production flow has been the essence of Abell-Howe service to industry for more than twenty-five years. No matter how large or small your plans may be, a talk with an Abell-Howe man will prove informative.

You will find a number of help/ul ideas in the 32-page Abell-Howe booklet, "Industrial Construction." Ask for your copy.

#### ABELL-HOWE COMPANY

ENGINEERS - CONTRACTORS - MANUFACTURERS

53 WEST JACKSON BLVD., CHICAGO 4, ILLINOIS . HARRISON 7-3383

INDUSTRIAL BUILDING CONSTRUCTION . CRANE RUNWAY BLDGS. . OVERHEAD CRANES AND HOISTS . MONORAIL SYSTEMS

#### Standardization for mass production

AN INTERVIEW WITH J. C. Sharp . VICE PRESIDENT, ENGINEERING



Standardization—whether related to the manufacture of electric ranges, automobiles, or prefabricated houses—is an es-

sential ingredient in any successful mass production operation. The world's largest range plant achieves a degree of standardization never before approached in the appliance industry.

To show the progress that has been made in standardizing our range production, it is necessary to go back a number of years and examine former manufacturing methods. In 1936 the Hotpoint line of electric ranges called for the manufacture of 13 different range bodies in three different finishes. The number of component parts to supply this variety of bodies was necessarily very high. This resulted in inefficient production; in effect many models were practically made to order.

At that time Hotpoint manufactured — 10 types of cooking tops, 8 oven linings, 11 range doors, and 40 front panels. While the individual models had an overall resemblance, few parts were interchangeable. Synchronizing the flow of a wide variety of component parts was a problem in itself.

#### Finish standardization

After 1936 a step forward was made when white became the standardized finish. In 1941 the number of models was reduced to six, with only two basic bodies requiring different component parts.

Shortly before the war the Marketing Department concluded that the electric range had won sufficient public acceptance to justify manufacturing this appliance on an assembly line mass production basis. To do this, we would need a new plant containing the most modern production equipment in the industry. This conveyorized, assembly type operation would demand a highly integrated factory in order to speed the flow of incoming materials through the various manufacturing phases and into the shipping warehouse as the finished product.

Plans for such a factory, largely completed at the war's beginning, had to be shelved until 1946 when we resumed peacetime production. Meanwhile the demand for electric ranges, along with our other appliances, had risen sharply throughout the war when consumers were unable to buy the home equipment they needed. Therefore, our plant had to be built and set in operation in the shortest possible time. The new 1,000,000 square foot range factory was erected in 15 months and had reached a good level of production by the fall of 1948.

#### One basic range body

In discussing new range models with our sales people, we agreed that the new lines, with the exception of a small apartment house model, could be produced from one basic body. As a result, all new models were essentially the same range from the floor to the work surface. This meant that we could use the same drawers. oven liners, and other component parts throughout the entire line. At the end of the war we were faced with rising costs of materials which resulted in a greater retail price differential in our low, intermediate and top model. However, this differential was justified by the introduction of new cooking features.

The foremost of these was the pushbutton control. The trend in postwar range design was an increase in the height of the back splasher. A high back splasher provided an ideal panel on which to mount the pushbuttons. These new simplified controls made it possible for the housewife to cook her meals by setting an automatic timer and touching a button. The transparent buttons, controlling the four surface units and the oven, have colored lights to indicate the selected heat setting. The location of the controls, a departure from the conventional switches mounted on the front of the range, also provided greater visibility, safety and accessibility.

The new range plant, coupled with this high degree of standardization, gives Hotpoint a production capacity of 600,000 ranges per year, involving one basic body. Tooling costs which are approximately three or four times the prewar level are an important consideration in our modern operation. The new plant makes it possible to make yearly model changes without staggering tooling expense.

Formerly we were faced with shutting down for a model changeover, with the loss of three or four weeks' production. Now model changeovers are greatly simplified because we are to Page H-13

J. C. Sharp

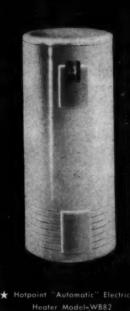


finish october • 1949





★ Hotpoint "Aristocrat" Electric



No dull seasons, no 'off' weeks''. That is the Hotpoint keynote, as expanded production keeps a steady stream of sales-stimulating appliances moving to dealers nationally. Custom-built kitchen and laundry appliances, backbone of a sensational line, make for year 'round profit opportunities.

\* Hotpoint Ironer Model LF1

In high wattage Calrod\* units which heat-power ranges, water heaters, ironers, clothes dryers, and commercial cooking equipment of all types, Hotpoint employs Nichrome and Nichrome V—as the all-important electrical resistance wires.

For Nichrome assures a lifetime of trouble-free operation to consumer and retailer alike... is the very heart of good electrical appliances everywhere.

If your manufacturing sources are not using heating elements of Nichrome, profit by asking them to do so now. Like Hotpoint, you'll find Nichrome makes for increased sales, abundant good-will... a host of satisfied customers that stay sold.

\*Nichrome is manufactured only by

### Driver-Harris Company HARRISON, NEW JERSEY

BRANCHES: Chicago, Detroit, Cleveland, Los Angeles, San Francisco, Seattle

\*T. M. Reg. U. S. Pat. Off.

### A progressive sales program is the key to production volume

AN INTERVIEW WITH Fired J. Walters . VICE PRESIDENT, MARKETING



Hotpoint enters the fourth quarter of 1949 with its marketing organizations in place and ready to meet quotas on its 12 ma-

jor appliances. The high volumes now being produced are dramatized by the range output which is keeping the "world's largest range plant" operating on a full 5-day week.

Plans to meet competitive conditions by vigorous sales leadership have been in preparation for more than two years; these programs are based on the teamwork idea which has meant the coordination of our headquarter staff with our district managers in the field, 100 distributors, and 10,000 dealers.

These programs involved dovetailing our advertising, sales promotion, sales training, merchandising materials, and home economics activities into a single concerted effort to sustain a high level of sales.

The accumulated demand for appliances resulting from the non-productive war years had not yet been satisfied when the new factory began formal production a year ago. However, marketing management recognized that this demand would soon be wiped out, placing the industry once again on a fully competitive basis.

Consequently, it was of utmost importance that we accelerate our marketing programs so that we would be prepared for the return of competition. Sales for the first quarter of 1949 were the best in our history. Immediately following this period, however, we felt a definite slackening in sales that heralded the return to normal conditions.

Necessary production curtailments were accompanied by the launching

of vigorous sales programs to offset lagging sales. At the same time a wave of price cutting ran through the industry. This price nibbling, aimed at bolstering consumer buying, had just the opposite effect. The public further delayed buying home appliances, believing that prices would continue to drop appreciably.

#### The truth about appliance prices

There was no time to be lost in halting this sales lag. Our mass production operation was predicated on high volume output which could only be possible by maintaining a high sales level. An institutional advertisement, "The Truth About Appliance Prices," was run in 100 key city newspapers. This was aimed at stabilizing the market and restoring buying confidence.

The reaction to this program was favorable. At the same time we enlarged our electric utilities sales group and intensified a program for dealer advertising, and promotion. When dealers had become alerted to the new competitive situation, and the public assured that prices had reached a reasonable level, sales took a sharp upturn.

As consumer buying increased, dealers and distributors were able to work off inventories that had accumulated during the summer. While Hotpoint had felt the industry-wide slump, at the end of the first eight months of this year our sales were ahead of the similar period a year ago.

This rapid comeback, I believe, reflects the redoubled efforts of our marketing organization in coordinating and intensifying sales programs. During 1949 a number of national activities were carried out by our dealers to dramatize for the public the values that latest model appliances offer. Automatic electric living—emphasized in continuing promotions on allelectric kitchens and home laundries—reached a new height with the introduction of an electric range controlled by pushbuttons.

This development climaxes the 40-year history of the electric range, first manufactured in 1909 by the late George A. Hughes, founder and first president of Hotpoint. This anniversary event will be staged by the company's dealers throughout the nation. The fortieth anniversary activity also renews the close relationship of the electric appliance and electric utility industries. A broad electric utility program is now being activated to expand utility participation in merchandising electric ranges and other appliances.

#### Stepping up distribution efficiencies

Now that the postwar pattern competitive selling has become crystallized, our marketing objectives center about stepping up distribution efficiencies to match production and engineering gains. As we enter the fourth quarter of 1949, marketing programs to Page H-13 →

Fred J. Walters



finish october . 1949

A Bright
Spot

## on every.... HOTPOINT RANGE



A Bright Spot on every Hotpoint Range is the deep well cooker which adds so much to the convenience and "usability" of the modern electric range.

The deep well cookers we build for Hotpoint are made to their exacting specifications and high quality requirements. Aluminum Specialty Company is keyed to meet the most rigid requirements of the electric range industry as a result of 40 years experience in the manufacture of cooking utensils and the fabrication of special aluminum contract stampings.

In addition to our service to the electric range industry, we are in position to furnish all types of aluminum stampings or

fabricated components for every segment of the appliance field. For the refrigerator, for instance, we furnish ice cube trays and grids, evaporator back plates and shelves, vegetable and meat-keeper pans.

Aluminum parts fabricated by Aluminum Specialty can be furnished with the finest anodized finish based on years of experience in this exacting finishing work. All other approved aluminum finishes can also be furnished.

Whatever your aluminum stamping problem, bring it to Aluminum Specialty experts for suggestions. We operate our own tool and die shops for complete control of our products.

#### ALUMINUM SPECIALITY COMPANY

New York Office 200 Fifth Avenue MANITOWOC

Chicago Office 1170 Merchandise Mart



#### Edward R. Taylor—

sales manager - joined the firm in 1946 as merchandising manager. Then he became manager of market development, and more recently was moved up to his present position. He is responsible for coordinating sales activities of district managers as well as sales programs for distributors and dealers handling the company's full line of appliances.

#### Albert H. Behnke-

vice president-joined Hotpoint in 1918 as a production man, and five years later became a buyer of steel. He was promoted to production manager and assistant director of purchases in 1936, a post he held seven years until he was made manager of the ordnance division handling company war work. After the war he served as manager of purchases and production. He was named manager of materials in 1947, and was elected a vice president the following year.





#### Patrick W. Ryan \_

general superintendent for the past two years-began his Hotpoint career as a shop clerk 25 years ago. He became a time study man and just before the war was made a foreman. He became general foreman during the war, and later superintendent. In his present position, he coordinates the operations of all plants.

#### Forty years of progress

→ from Page H-5

already high industry position.

2. A new educational drive was necessary to accustom people to pay higher prices in keeping with the new economic plateau.

3. We would have to spearhead an industry drive to coordinate those salesmen trained in the 1920s, now past their prime, with the new postwar school who had never felt the hot breath of competition on the backs of their necks. The industry would require 150,000 of these aggressive young men.

4. We laid plans to organize and activate an electric utility program by which these pioneers of electric cooking would resume their places as local leaders for the promotion or sale of electric ranges.

Today, four years after the war's end, we are again in the thick of competition, and our program to meet the conditions described above is well under way. New engineering developments, coupled with new production skills and techniques, made it possible to give consumers greater values in appliances. We have faced the need for lower prices and have adjusted them downward rapidly and thor-

Now that engineering and production problems are behind us, the foremost challenge facing management is the institution of programs for marketing increased outputs from our advanced facilities. While it is too early in the competitive period to say how quickly this final objective will be accomplished, Hotpoint's program is proceeding on all fronts as planned. We open the fourth quarter of 1949 with sales of the year to date surpassing those of any similar period in the company's history.

#### Progressive sales

→ from Page H-11

have been carefully planned to answer the increasing demand for

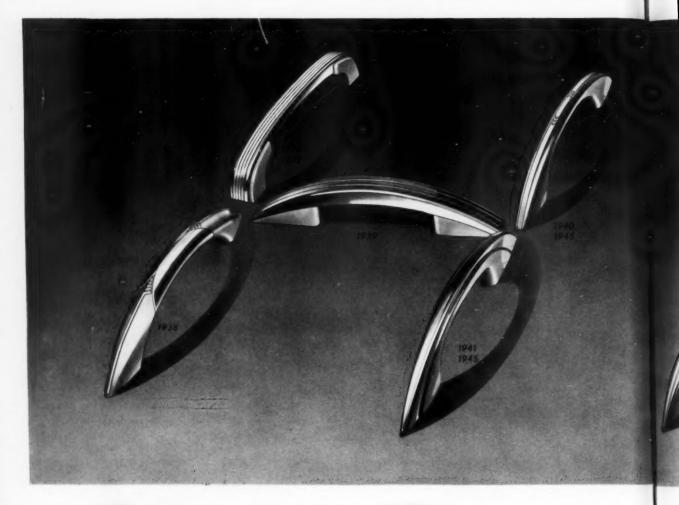
skilled selling. As a result, the period immediately ahead should be characterized by sales programs which are more effective than anything experienced since the late 1930's.

#### Standardization for mass production

→ from Page H-9

working with one range body and work surface units that are identical to a point 11/2" above the cooking

The new plant allows us to produce four basic models having standard parts from the floor to the back splasher. While the new plant has 1,000,000 square feet of manufacturing space, we are getting maximum production from a minimum of floor space and equipment investment. Hotpoint's range manufacturing facilities have served as a model for injecting new standardized production techniques into our other lines of products, particularly water heaters and dish washers.



## Handle Progress

For an unusual study of progress in the design and manufacture of appliance handles you need look no farther.

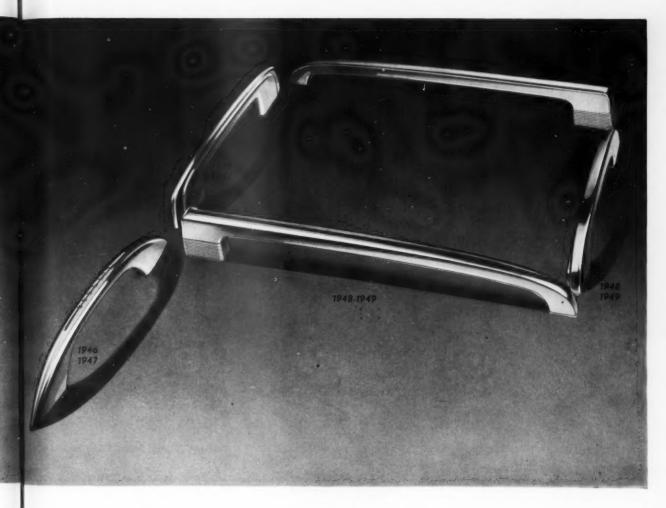
Making up the letters "H" and "P" pictured at the top of these two pages are accurate reproductions of the various handles with which Hotpoint electric ranges were equipped during the last dozen years or more.

Working hand-in-hand with the Hotpoint engineering staff, Winters & Crampton supplied these handles to help give Hotpoint ranges the last word in glamorous sales appeal. Built in are beauty and service essentials favorable to prospect "point of sale" action . . . plus the long years of service that alone bring complete owner satisfaction.



H

H



## swith Hotpoint Inc.

How well they have succeeded is readily attested by the records of Hotpoint's sales down through these years . . . or by personal examination of the flawless mirror finish that still marks the Hotpoint range or refrigerator handle as an item of beauty after years of faithful service.

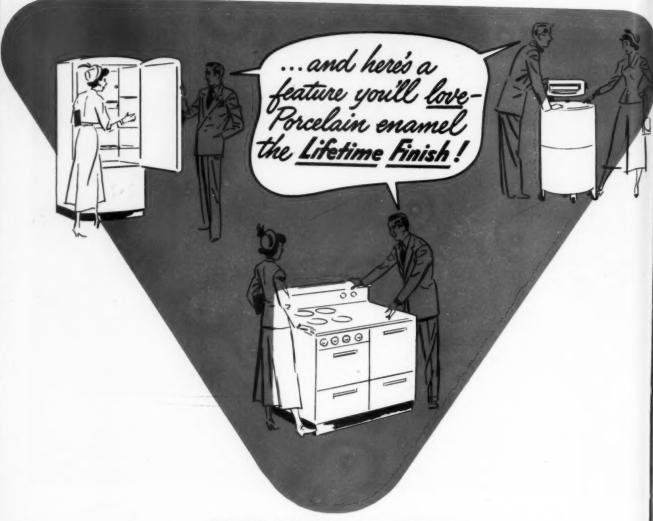
Whatever your needs may be, our design engineers will welcome an opportunity to prove to you that Winters & Crampton can profitably be —

Your primary source of operative hardware, and decorative metal trim for household appliances

eed

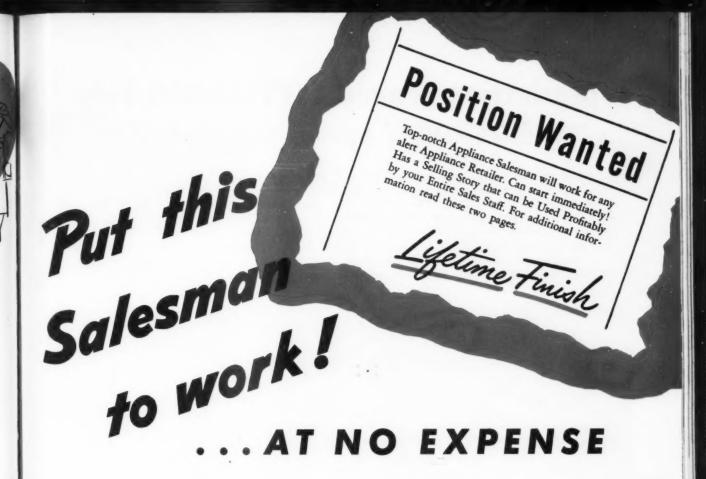
ucast

uty



Play up these LIFETIME FINISH advantages!



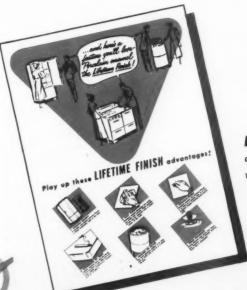


Porcelain enamel, the Lifetime Finish, can help boost sales and profits for YOU, for your dealers, and retail salesmen. It can become one of your strongest selling points . . . a potent sales "clincher". But, to have it do so, you must consistently remind your

25

selling organization of the sales building opportunities offered them by the Lifetime Finish.

No customer, at any level, should be permitted to overlook the new, improved Porcelain enamel finish you are now furnishing on your products. It's truly a Lifetime Finish that provides customers with an easy-to-clean surface, one that is not affected by ordinary heat . . . a surface, that is highly resistant to abrasive action, is permanently attractive. These are all features that should not be overlooked in the presentation of your product.



REPRINTS? If you would like to have a quantity of reprints with the Lifetime Finish selling points, write us; we will be happy to oblige.

A Dependable Guide to the Best Supplies for Better Porcelain Enameling

FERRO ENAMEL CORPORATION

4150 East 56th Street

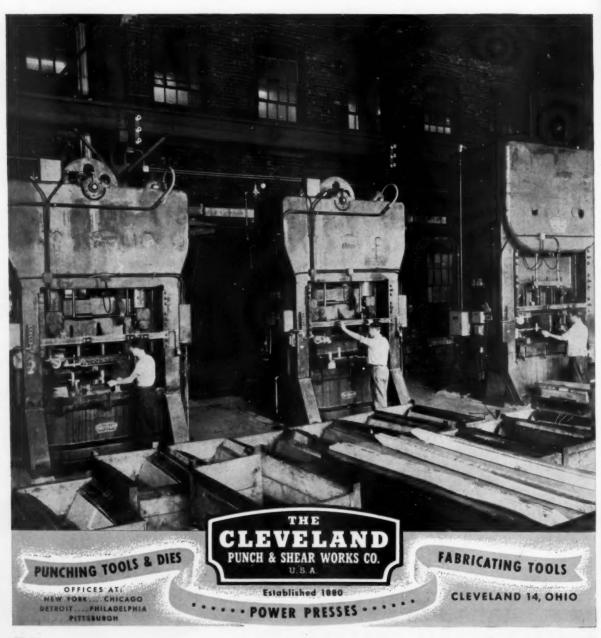
Cleveland 5, Ohio



## production proved CLEVELANDS help HOTPOINT speed schedules

Quality at low unit cost is a prime requisite in all of Hotpoint, Inc.'s modern appliance plants. For high speed, precision blanking and forming of appliance bodies and component parts, Hotpoint, Inc., utilizes a battery of Modern Cleveland Presses.

If you are interested in lower production costs, be sure to investigate the numerous advantages offered by Modern Cleveland Presses. High production rate, ease of operation, constant accuracy and minimum maintenance costs are assured by sound designing and rugged construction. The various types of Modern Clevelands are made in a wide range of sizes and capacities. If, however, you have special requirements our engineers will gladly work with you to arrive at the most effective solution. Write or call today for bulletin 11-8.





## KITCHEN-WISE MANUFACTURERS ARE WEIRZIN-WISE, TOO for very good reasons!

Products that are fabricated from Weirzin have a "head start" on the road to success because of their basic sales advantages.

Weirzin's affinity for paint, enamel and lacquer assures an excellent appearance, with less danger of the finish checking, chipping or being damaged by constant cleaning. And Weirzin-built products are protected

against unsightly and damaging corrosion of exposed metal parts.

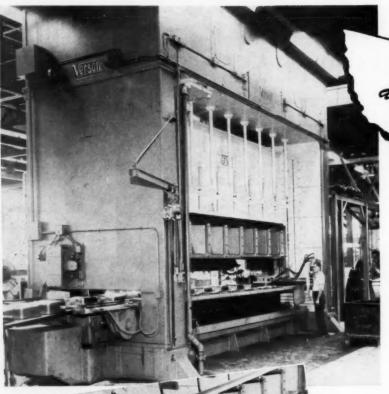
The kitchen-wise manufacturer is wise to the fabricating advantages of Weirzin, too. It will not rust or corrode in stock . . . it requires no pickling or buffing before fabrication. nor prime coating before finishing.

Products that require extensive deep-drawing, forming and purching are "naturals" for Weirzin electrolytic zinc-coated sheet or strip.

WEIRTON STEEL CO.



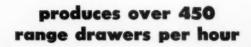




World's largest automatic drawing press!

THIS erson

> TRANSMAT **PRESS**



A completed range drawer every 81/9 seconds-from a single machine with a single operator! That's the production rate of this Verson TRANSMAT Press in use in the ultra modern plant of a leading range manufacturer. Believed to be the largest automatic drawing press in the world, this TRANSMAT measures 258 inches between housings and weighs 270 tons.

This huge TRANSMAT press typifies what Verson can do to speed production and reduce unit costs for manufacturers of formed metal products. Whether you need a single press or a complete tool-up including presses and dies, we will welcome the opportunity to go over your requirements with you and make recommendations.



THIS IS THE DRAWER Measuring 15" x 18" x 6" deep it is formed from coil stock. Operations, which include blank and draw, trim, curl, and flange, are performed automatically without intermediate handling, pickling or annealing.

Originators and Pioneers of Allsteel Welded Stamping Press Construction

#### VERSON PRESS COMPANY

9320 South Kenwood Avenue, Chicago 19, Illinois

Holmes Street and Ledbetter Drive, Dallas 8, Texas

VERSON PRESS FOR EVERY JOB FROM 60 TONS UP!

DRAWING PRESSES

FORGING PRESSES PRESS BRAKES . DIES DIE CUSHIONS HYDRAULIC PRESSES

BLANKING PRESSES

## **Fabricating the parts**

## for the Hotpoint range

each major component is produced in straight line production with many major fabricating operations using especially designed automatic equipment

By B. E. Schroeder · VICE PRESIDENT, MANUFACTURING, AND M. E. Maurer

· MANAGER, MANUFACTURING ENGINEERING, AS TOLD TO Matt &. Henerly



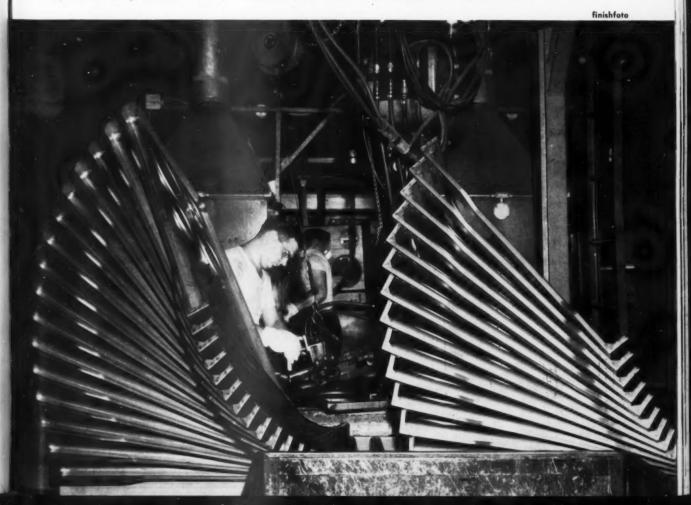
Some idea of the problems involved in setting up a plant capable of fabricating 12,000 electric range bodies and all of the ma-

jor components within the period of an 80-hour week may be gained by the fact that a total of 1200 tons of steel are required to produce 12,000 ranges. The first problem, of course, is the advance procurement and storage of an adequate supply of sheet steel in proper gauges, sizes and types. Types are mentioned due to the fact that both flat sheets and coiled steel are used in this fabricating plant.

The fabrication of the complete range can best be described by breaking it down into main body fabrication plus the major components which include doors, oven liners, drawers, back splashers, cooking tops, trim rings and bowls for surface units, and deep well cookers.

#### Main body fabrication

The complete range body fabrication line from the slitting of the steel to size, through stamping, forming, and welding, is all synchronized for straight-line operation, with each operation as completely automatic as could be devised.





finishfoto

Photo shows one of the fabrication lines which turns out range components at a rate coordinated with the other main lines feeding the finishing department.

First unit in the body line is a feeding and slitting machine which is loaded by crane with a 15-ton lot of sheet steel in 130" x 40" size. This machine automatically feeds the steel sheet through the slitting machine, cutting it to the exact size for the range body blank. The sheet is then automatically transferred to a roller conveyor, feeding the first of four 400-ton presses. The first of these presses performs embossing and spud piercing, the second pierces one oven opening and one drawer opening and trims both, the third finishes all additional piercing and notching required on the sheet, and the fourth does all of the necessary flanging operations such as those around oven openings, drawer openings, etc.

As the fabricated sheet leaves the bed of the fourth press, it is transferred automatically to a series of two folders which complete the forming operation. The first folder forms the back of the range; the second folder forms the sides to complete the range shape and determines the overall dimensions of the range front.

The formed body is automatically transferred to a multiple spot welder. Here the back of the range is sized and welded. At this point, the fabrication job is complete—after passing through nine operations—to become a completed body without the aid of human hands (a trimmer, four presses, two folders, and a welder.) These operations have all been completed in a span of 20 seconds.

The body shell is then automatically transferred to a gravity conveyor between two lines of portable welders where center inside bracing is welded to the body. Further operations include the addition of gussets, brackets and the center panel.

Synchronized in the automatic range body fabrication line is a multiple welder which squares the bodies and automatically completes 46 spot welds in a single operation. The horizontal and vertical plane of the body "toe space" and one spring bracket is manually welded to complete all fabricating operations.

At the end of this range body fabrication line, the completed bodies are carefully inspected and any rough spots are removed with a power grinder. The bodies are then hung on a transportation conveyor which carries them to the porcelain enameling department.

#### **Oven liners**

The oven liner fabrication line consists of manually operated equipment except for the principal welding unit. Fabrication involves three presses (250 tons each). These presses perform a 1st draw, 2nd draw, and trim, in sequence. The three presses are installed at right angles to each other and within easy transfer distance for the parts. At these presses, the first operator applies drawing compound to the sheet and feeds press #1 for the 1st draw. The second operator trips press #1, unloads it and loads #2 press adjoining at right angles. This press performs a re-draw. The third operator trips #2 press, unloads it and feeds the third press. The fourth operator trips the third press and unloads, transferring embossed blank to flanging machine. A six-stage flanging machine completes all flanging operations in a space of about 48 inches.

The completely embossed and flanged blanks now continue on the same conveyor between two power brakes where the liner is formed with four identical corner forming operations.

The liners next go to a special welding unit where an air operated jig sizes the unit while a multiple tack welding operation is completed. co

The lining is immediately transferred to a spot welder who attaches a "stiffener" across the mail weld area, after which an electric seam welder completes the closing of the circumference of the lining. An acetylene welder then completes the weld at the flange.

This completed circumference of the liner is then introduced into a small embossing press, where the surfaces which will form the top and bottom of the oven are embossed for added strength.

The next step is the application of the oven back in an especially designed multiple spot welder which completes 40 spot welds. These welds are accomplished progressively, two at a time, on each of the four surfaces. This unit also automatically determines the depth of the oven lining.

Next comes two presses in line which pierce a vent hole and a hole for thermostat clip. Liners then travel on a gravity conveyor which positions the unit at about a 45 degree angle to simplify grinding of weld areas at the flange.

Next, a press flattens the flange and sizes the oven opening. Another small press then pierces holes for hinges. Completed liners then go on a gravity conveyor to an inspection table from which okeyed liners go to the transportation conveyor feeding the finishing plant.

There are only two types of liners involved, a large and a small. Ninety per cent of the equipment can be used for both sizes interchangeably.

## Range drawers stamped from coil stock

One of the most interesting sections of the fabricating plant is the production line for range drawers. A single 450-ton transfer feed press completely fabricates the drawer unit. The press has 8 die stations, 6 of which are used for fabricating the present drawer. Steel "hands" move the drawer from station to station for drawing, trimming, forming, and beading operations.

Cold rolled stock is automatically fed to the drawer press from a coil cradle through a stock straightener. A new coil weighs 5 tons. The overall size of the drawer press is 17 feet wide by 21½ feet long by 27 feet high above ground and rests on a 13 foot deep foundation.

Lubrication for the sequence of operations on the drawer is provided by automatically spraying drawing lubricant on both die and steel as the metal goes into the first die operation.

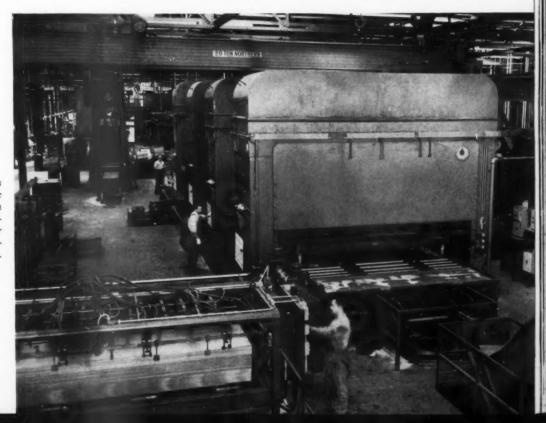
The completed drawers pass through a combination spray and vapor degreaser and from there are transferred to a line of automatic welding machines which attach fronts to the drawers, using 16 spot welds. This operation takes only 10 seconds. Following inspection, the completed drawers are now ready for the cleaning and finishing operations, which are described in another article.

#### A complicated back splasher

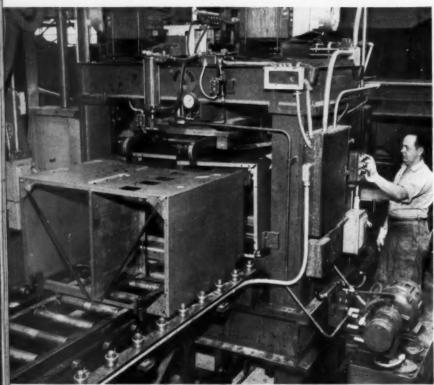
The back splasher design for the Hotpoint pushbutton range is somewhat more complicated than the conventional range back splasher. This part is very important to the Hotpoint pushbutton range as it is designed to carry many of the controls and important operating parts to make them readily accessible.

There are two complete lines of 10 presses each, varying in size from a small horn press to 350-ton, for the fabrication of all types of back splashers. Either line is used to fabricate any type of back splasher produced.

Eighteen gauge enameling iron is fed to these lines in sheets of approximately 46" width. The back splashers are drawn in pairs, each pair form-



Battery of four presses comprises automatic range body fabrication line. Sheet steel is carried by crane to feeder (left) which automatically feeds steel to presses.



Range bodies after being formed on automatic fabrication line pass through progressive multiple welder which welds 1-piece wrap-around steel body down the back.

Photo shows blank & draw die, No. 1 operation for range drawers. Automatic spray lubricating equipment is visible. One man operates complete 6-stage operation.



ing two complete splashers after they are cut apart later on the line.

Following is the sequence of the 10 press operations: (1) cut off and emboss from sheet, (2) first draw and emboss, (3) trim all around, (4) re-draw, (5) parting dies separate the "pair" of splashers to form two units, (6) perforate holes for "pushbutton" switches, (7) perforate window slot for light and form lug for supporting condiment holder, (8) form black flange, (9) form bottom flange, (10) pierce holes in bottom flange for trim.

Following the drawing operations, the parts then go to a washer for removing drawing compounds.

Back splashers then go to gun welders for the application of hinge brackets and corner reinforcements. Then they go to spot welders for the application of "window" clips.

Metal finishing consists of hand disc grinding of welds and any tiny imperfections. Units are then ready for the transportation conveyor to carry them to the enamel department.

#### Cooking top fabrication

As will be clear from the description of back splasher fabrication, the cooking top and back splasher are two separate units being hinged together during assembly. While this simplifies the fabrication of the cooking top to some degree, it will also be clear that the range cooking top must be designed and fabricated for extreme rigidity.

There are six presses in the range cooking top line varying from 40-ton to 350-ton.

The sequence of operations is: (1) blank sheet, (2) draw base for back splasher, (3) perforate surface unit holes and holes on back splasher base—also trim rear corners, (4) draw front and side flanges and flanges in surface unit holes, (5) trim front corners, (6) form all bottom flanges.

Following these operations, the top goes to a washer for removal of drawing compound.

Front corners are then torch checked with an acetylene torch to determine if any cracks or strains are present. This is protection for the porcelain enameling department.

Spot welding of hold down bracket

and lead clip which holds wiring comes next. Then comes gun welding of the corner reinforcements and gun welding of insulation guard and mounting bracket.

Grinding and metal finishing completes the fabrication of the top and it is then ready for inspection and the transportation conveyor to the enameling plant. Range tops and back splashers travel on this conveyor in sets.

#### Parts from special metals

Parts described previously are fabricated from either sheet steel or cold rolled steel. There are, however, several components for the range which are made of special steel or aluminum. Trim rings and reflector pans, for instance, which form parts of the surface heating units, are of special alloy steel. Here again, fabrication may be interesting due to the fact that the parts are fabricated in individual presses with 8 progressive stations. For trim rings, the sequence is as follows: (1) draw flange on circular blank, (2) blank out center circle, (3) re-draw, (4) trim outside diameter, (5) trim and re-draw, (6) perforate slots for coils, (7) swedge to get contour for top of ring, (8) lance in two positions. The reflector pans or "bowls" travel through a sequence of 7 stations in a single

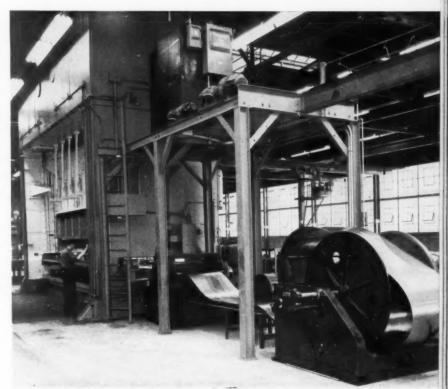
As these small parts leave their big press, they go to magnetic chucks feeding a conveyor of an automatic polishing machine. There are three stages of polishing, rough, medium and fine, employing 180, 240, and 320 grit belts respectively.

From the polishing machine the parts are loaded onto the conveyor of an automatic plating machine.

#### Small parts

There are many, many small components required for the completion of the range. In some instances, these are made on high speed automatic presses capable of turning out as many as 175 small parts per minute.

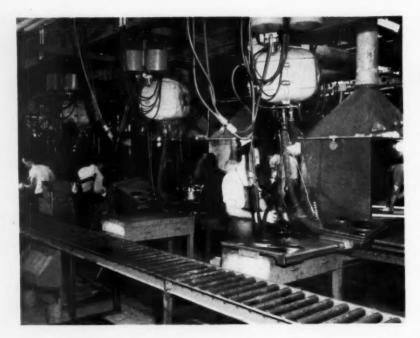
As was indicated at the beginning of this article, the quantity of steel used is great and it is therefore important that each part for the range be designed to use steel economically.



Cold rolled stock is fed into 450-ton transfer feed press which fabricates range drawers. Press has 8 die stations, 6 which are used for fabricating present unit.

The conveyor line at the left travels from the degreaser. The line on the right takes welded range drawers to the finishing department.







Gun welders attach brackets to cooking tops for fastening tops to range bodies.

It has been said that the large packing houses use "every part of the pig but the squeal." This is just about what is attempted in the fabricating department at Hotpoint. For instance, at such points on the fabricating line as the first stamping operations for the range body, the stamping of the main burner holes for the range top, etc., there are sizeable blanks of "scrap" steel. Presses at these points have automatic conveyors carrying their "scrap" to inspection belts where all small pieces that will pass inspection are carried to stock for the production of the many smaller parts for which the steel is entirely suited. By these "saving the squeal" tactics, it is possible to save many tons of raw material in a production fabricating plant of this size.

As can be seen from the foregoing description, all of the major parts to be fabricated have their own straightline production facilities which take them from the raw sheet or coil through progressive steps, many of them automatic, to the point of inspection for the completely fabricated component. Organic or synthetic type finishing and plating operations are located within the main area of the fabrication department. Fabrication lines for all parts to be porcelain enameled lead to the transportation conveyor which carries them to the porcelain enameling division.

The complete fabricating department houses 91 presses ranging from 5 tons to 1000 tons. In addition, there are 9 especially designed forming machines, 55 automatic welding machines, and 32 portable welding units for hand operation. All of this equipment is coordinated and synchronized so that it is capable of delivering 12,000 units per 80-hour week.

Photo shows press used for fabricating trim rings for range surface units.



When Mrs. America buys a Hotpoint Range, she gets...in addition to beautiful appearance and functional design...famous Calrod Heating Units.

In this, as in other ways, Hotpoint insures the fullest measure of dependability and satisfactory service life. Spill-overs can never damage Calrod Units because the heating elements are hermetically sealed in an armor of rustless, heat-resisting Inconel.\*

The delicate heating elements are safe from mechanical damage, too, thanks to Inconel's remarkable hot strength. And Inconel holds its steel-like strength for years on end, despite red-heat operating temperatures. Inconel never cracks, softens or scales away.

Because of these outstanding characteristics, by far the majority of electric range manufacturers have adopted Inconelsheathed heating units.

#### Inconel for burning tools, too

The same characteristics that recommend Inconel for heating-element sheathing have made it a performance leader in many other applications where thermal durability and high resistance to corrosion are essential. In enameling burning tools, for example, Inconel's high hot strength permits lighterweight tools, with correspondingly increased furnace loads and lower fuel bills.

Still another advantage...Inconel's tightly adhering oxide does not flake away to spoil expensive finishes. And being non-spalling, Inconel tools require less maintenance; do not have to be frequently wire-brushed.

Inco's Technical Service Department will gladly supply names of qualified fabricators. Write for them today.



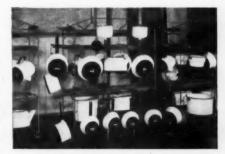
#### THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N.Y.

\*Reg. U. S. Pat. Off.

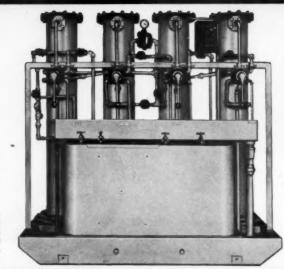
Inconel burning tools in use at Moore Enameling & Mfg. Co., West Lafayette, Ohio. Hanger bars supporting the burning tools are also Inconel.

Tools were fabricated by Strohecker, Inc., 892 Mahoning Ave., Youngstown, Ohio.



# For Mill Room ASSURANCE That the "SLIP" is Always RIGHT

## INDUSTRIAL'S NEW WATER DEMINERALIZERS



These ion-exchange demineralizers deliver the chemical equivalent of distilled water by simply passing water through ion-exchange resins. All dissolved mineral salts are removed without the use of any stills, heat, or steam. No cooling water is required and there are no scale formations. And the cost of this demineralized water is only a few cents per 1000 gallons compared to the several dollars for distilled water or steam condensate.

Model L-200 Four-Bed Industrial Water Demineralizer for a nominal flow rate of 200 gph. Other standard models available with capacities of 5 to 1000 gph. Special units of any capacity engineered to requirements.

## For Dependable Results in Solution Clarification

## INDUSTRIAL'S FILTERS AND FILTERING SYSTEMS

In production filtration here are some points to check. Compare these construction and operating features of Industrial's filters.

Industrial's filters are conservatively rated on capacity. Compare the filtration area, the sludge holding capacity of the filter chamber, and the pump characteristics. All these factors govern the capacity of the filtering system. The filter cloths in connection with filter aids provide efficient, low-cost filtration in either continuous or intermittent service.

The air wash cleaning feature does not require any dismantling of the filter or removal of the cover. Industrial's filters have operated for months without opening—opening is required only for replacing filter cloths or for periodic inspection. This feature is a great time and labor saver.

\* Write for full information and recommendations



A typical Industrial Stationary Filter System. Standard models—portable and stationary types—are available in capacities of 100 to 15,000 gph. Special filters are engineered to meet unusual requirements.

INDUSTRIAL FILTER &

1627 West Carroll Avenue • Chicago 12, Illinois

PUMP MFG. CO.

PHMPS

RUBBER DIVISION
Vulcanized Linings • Molded Products

FILTERS

CORROSION TESTING APPARATUS Salt Fog Humidity

> WATER DEMINERALIZERS



FOR AUTOMATIC WASHER LIDS, Hotpoint uses Kaiser Aluminum because its fine texture and uniformity gives it exceptional finishing qualities. Thus, the lid has a longer-lasting, more attractive finish!

FOR DISHWASHER DOORS, Hotpoint uses Kaiser Aluminum because it has excellent corrosion resistance and the ability to withstand rough treatment.

## Hotpoint

## builds in the "extras" to build extra sales

Hotpoint's wise choice of materials is an important reason why customers get extra quality, extra value for the dollars they spend.

One of those materials is light, strong, versatile Kaiser Aluminum. With it, Hotpoint has been able to improve products through better fabrication techniques-and cut manufacturing and equipment costs.

You can get those same advantages. For more information, just call or write any of Permanente Products' nationwide sales offices listed below.

### Permanente Metals

PRODUCER OF

## Kaiser Aluminum



has no chemical reaction on foods.

SOLD BY PERMANENTE PRODUCTS COMPANY, KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN: Atlanta • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Houston • Indianapolis • Kansas City • Los Angeles Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Portland, Ore. • Seattle • Spokane • St. Louis • Wichita EXPORT OFFICE, OAKLAND, CALIFORNIA WAREHOUSE DISTRIBUTORS IN PRINCIPAL CITIES

## Flow chart for the world's largest r

THIS drawing shows the flow of materials and components through three sections (fabrication, enameling, and assembly) of the world's largest plant devoted solely to the production of domestic ranges.

Red lines show flow but do not necessarily indicate conveyor travel. This drawing represents less than half of the total plant area. To the south are storage rooms, maintenance department, tool room, receiving, a large section devoted to manufacture and testing of heating units, hospital, cafeteria, and a factory office. To the west is a spacious warehouse and shipping department. Railroad spurs run between the plant production departments and warehouse, and another spur serves the plant along the east building line.

A Equipment: Dip tank, infra-red driers, reinforcing and stippling booths. Conveyor runs counter-clockwise.

Routine: Dip oven lining, dry reinforce, dry stipple and stencil oven rack shart — to furnace chain.

**B Equipment:** Two dip tanks, drier, reinforcing booth. Conveyor runs counter-clockwise.

Routine: Dip cooking tops and back splashers, dry, reinforce — to furnace chain.

Cequipment: Continuous spray booth, drier, brushing booth. Conveyor runs clockwise.

Routine: Cover coat to cooking tops. Stone ground coat and add masking ring to unit holes, spray, dry, brush and remove masking ring — to furnace chain.

D Equipment: Same as C (lines interchangeable).

Routine: Cover coat to back splasher. Stone ground coat, spray, dry, brush (air operated brushing wheels)—to furnace chain.

E Equipment: Twin dip tanks, drier, reinforcing booth. Conveyor runs counter-clockwise.

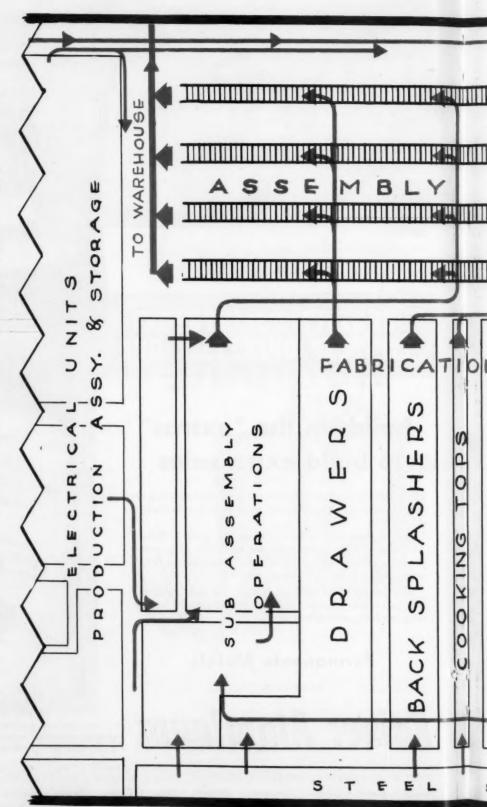
Routine: Ground coat to range body. Dip (with hoist), dry reinforce — to furnace chain.

F Equipment: Continuous spray booth, drier, brushing booth. Conveyor runs clockwise.

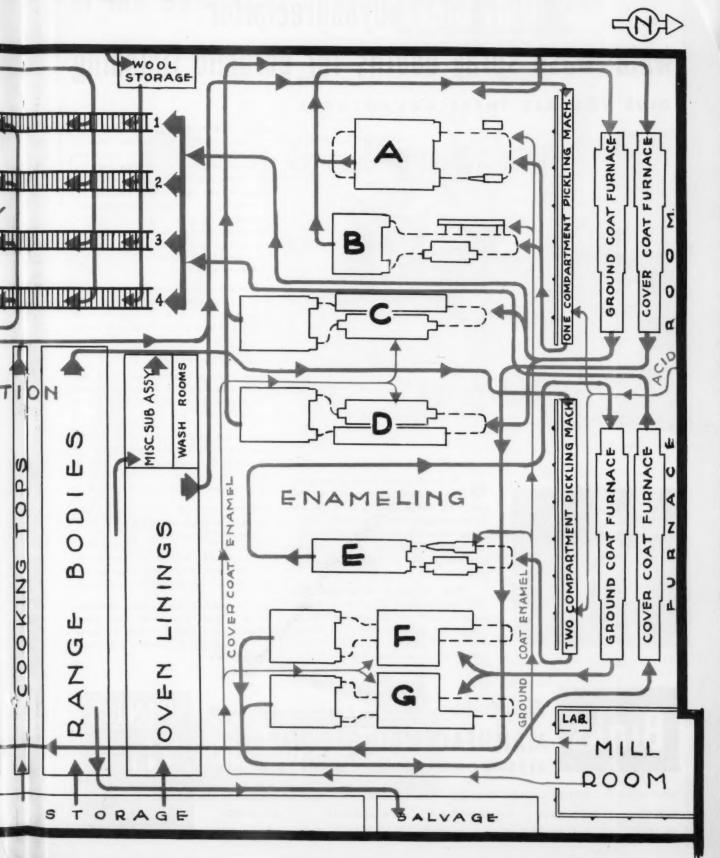
Routine: Cover coat to range body. Stone ground coat (on conveyor), hang on masking shield (for reducing brushing), spray, dry, brush—to furnace chain.

G Equipment: Same as F. Conveyor travels counter-clockwise.

Routine: An alternate line duplicating facilities of line F.

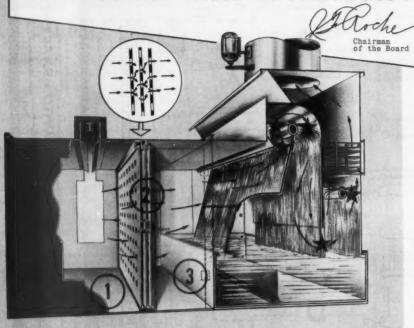


## trange plant



# Only Binks Dynaprecipitor water-wash spray booths for ceramic finishing

GIVE YOU ALL THESE ADVANTAGES . . .





No other spray booth gives you the high efficiency and low cost operation to be found in a Binks Dynaprecipitor unit. The booths illustrated here are designed especially for ceramic finishing. They can be engineered to accommodate any product.

With a Binks Dynaprecipitor unit, the finishing department stays cleaner and more healthful — a pleasanter place in which to work. Almost 100 percent of the frit in the over-spray is reclaimable.

All frit is removed from over-spray. Binks Dynaprecipitor units for ceramic finishing have a perfect air-cleaning action. Part of the over-spray settles on the floor of the booth (1). Most of the remaining frit is trapped by the staggered baffle plates through which the air is drawn (2). Still more frit collects in the antechamber to the water chamber (3) and the little which is left is quickly washed out in one of the five washings (see stars \*) the air receives before it is vented. All frit in the oven-spray is reclaimable.

Easy to clean. Binks Dynaprecipitor units are easy to clean. A service door gives entrance to the booth. The baffle plates are quickly and simply removable without use of tools of any kind. The air is cleaned so thoroughly that no frit ever reaches the fans or exhaust ducts.

Unique clog-proof construction. There are no nozzles to clog. The water is distributed directly from the large manifolds by means of deflector plates.

Uniform distribution of large water volume. There are no breaks in the water curtains . . . no gaps in the air-washing spray. There is more water circulated per lineal foot of a Binks Dynaprecipitor than any other booth.

Manifolds constantly flushed. The water constantly circulates through the manifolds to prevent settlement of sediment.

Water economy. The water is circulated over and over again. Moisture eliminators remove all of the water from the air before it is vented.

Wear-resistant pumps. The water circulating pumps on Binks ceramic water wash spray booths are of special construction. The materials used are highly resistant to abrasion, give long service.



Send now for your free copy of our new catalog-data book.

## MANUFACTURING COMPANY

3122-40 Carroll Avenue, Chicago 12, Illinois

NEW YORK

DETROIT

LOS ANGELES

NASHVILLE

PHILADELPHIA

CLEVELAND

ST. LOUIS

SAN FRANCISCO

SEATTLE

WINDSOR, ONTARIO, CANADA



## For the beauty of Hotpoint ranges ...

the beauty, quality and serviceability of Grand Rapids Brass
HARDWARE

Hotpoint, Inc., one of the world's largest manufacturers of electric ranges, specifies Grand Rapids Brass Hardware. These high pressure, zinc die-cast handles offer the same high standards of beauty, quality and service for which Hotpoint stoves are famous. Like Hotpoint, Grand Rapids Brass is a leader in its field ... under contract to many of America's top-flight manufacturers. This hardware is modern in design and beautifully finished in polished chrome. Grand Rapids Brass Company is proud to be a supplier to Hotpoint, Inc.

Grand Rapids Brass

GRAND RAPIDS 4, MICHIGAN

DIVISION OF

CRAMPTON MANUFACTURING COMPANY



# AM-RO-CO IS USED IN HOTPOINT ELECTRIC RANGES AND OTHER HOME APPLIANCES

Hotpoint and many other of the country's leading major appliance manufacturers who have insulating problems, have turned to AM-RO-CO Industrial Felt Insulation as a logical answer. Whether it's a problem of sealing in heat in a domestic range or water heater, or a problem of sealing in cold in a refrigerator or home freezer, AM-RO-CO will do the job effectively, efficiently and economically. It also finds extensive use in industrial applications such as ovens, driers, boilers and tanks, warm air ducts, etc. This highly efficient form of mineral wool insulation offers dependable uniformity. Its thickness and density are controlled by the skillful application of synthetic binders in the fabrication of mineral fibers to an exacting standard of accuracy.

AM-RO-CÓ Industrial Felt is tough and durable, and handles easily with minimum breakage. Thus it can

be applied to curved or uneven surfaces without loss of time, thereby reducing installation costs.

of time, thereby reducing installation costs.

AM-RO-CO is pliable and resilient. It assures a snug fit which will establish a permanent barrier against the loss of heat or cold.

AM-RO-CO, when squeezed into position, will spring immediately against irregular surfaces and seal the insulation area. It is inert and will not settle or disintegrate.

AM-RO-CO is odorless, fireproof, water-repellent, and resists the action of most chemicals. The basic mineral wool fibers used in its fabrication possess a low alkalinity factor which meets U.S. Government specifications.

AM-RO-CO gives any product an added value of consumer satisfaction. It represents sturdy, lifetime service of unvarying excellence.



AM-RO-CO is easy to install. Cuts readily. Bends to curved surfaces with a pilability that resists breakage and costly replacements. Its resilience guarantees a snug, permanent fit.

This is an illustration of the AM-RO-CO Industrial Felt as used at Hotpoint for insulating the ovens of the "push-button" ranges. The resilience of the insulation guarantees a snug permanent fit.



## AMERICAN ROCK WOOL CORP.

120 South LaSalle St., Chicago 3, Illinois
PLANTS: WABASH, IND., S. PLAINFIELD, N. J., CLEVELAND, O. BIRMINGHAM. ALA., RED WING, MINN., TORRANCE, CALIF.

# "GRINDING COSTS REDUCED-

## with LOCKE BRICKS and BALLS"

BAVINGS UP 76 25% on grinding operations is a familiar story to compelers why fandardize on Locke's new, improved Bricks and Balls. Try them. Concess are you'll see marked improvement in your grinding operations. for three reasons:

paster or Inding—Locke Grinding Balls are handmade. This gives them a uick-acting irregular surface and a compact body that resists wear teeps balls heavier, longer.

tone at LIFE—Locke Bricks and Balls are more resistant to abrasion and basakage because they're completely vitrified—have no laminations

1883 C NTAMINATION—Made of special wet-process porcelain (originated by Locke in 1893), Locke Bricks and Balls are pure white and non-porcelain... do not require costly hand scrubbing... wash easily with a sum bosing.

Next time you d bricks and balls, specify Love AvailLOCKE

E BRICKS and BALLS

BETTER MADE...because they're backed by Locke's 55 years experience with wet process porcelain PLUS the product control and development facilities of the new Fred M. Locke Research Laboratory, one of the world's finest and largesti

SPECIALLY DESIGNED AND **BUILT FOR** THE CERAMIC INDUSTRY \*\*\*\*\*

Production sets a big broost quality is improved and entirely to the production sets a big broost requality is improved and entirely to the production be set entirely to the set high special set entirely to the set of the set high special set entirely to the set of the set high special set entirely to the set of the s standard determined overlappines sead property for ceramic faisting, the production from the controlled quality the annual production for the controlled quality and faithful and production for the controlled quality throughout the status of the season of Henry and carefully controlled quality includence in the state of the controlled production and the state of the controlled production in the state of the state of the controlled production is also state of the state of t

DE V

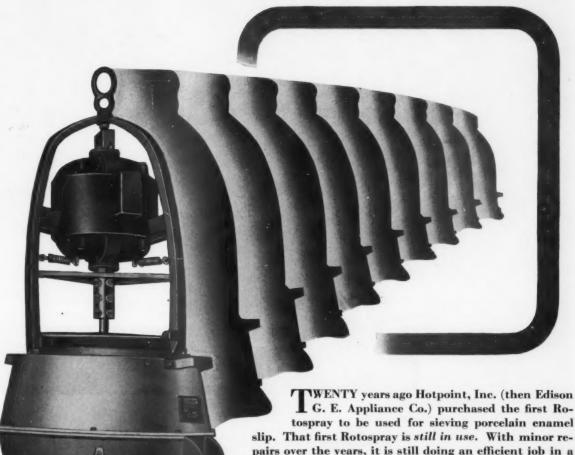
The state and uninest cuted production. The state of the SS means Quality in all four . .



SPRAY EQUIPMENT EXHAUST SYSTEMS AIR COMPRESSORS HOSE & CONNECTIONS

THE DEVILEISE COMPANY

## Twelve Rotosprays at Hotpoint... and the first one still in use



G. E. Appliance Co.) purchased the first Rotospray to be used for sieving porcelain enamel slip. That first Rotospray is still in use. With minor repairs over the years, it is still doing an efficient job in a Hotpoint porcelain enameling plant.

During the succeeding years, new Rotosprays have been added as Hotpoint enameling facilities have been

expanded. Today the company uses twelve Rotospray units in three enameling plants to keep enamel slip clean. Hotpoint appliance finishes must be first quality and Rotospray does the essential job of keeping them clean.

Like Hotpoint, other leading producers of home appliances consider Rotospray the Standard Method of sieving. Check your plant now and be sure it is properly equipped.

Contact us direct or one of our authorized representatives.

Sales representatives —

B. F. DRAKENFELD & CO., INC., New York, N.Y.
PEMCO CORPORATION, Baltimore, Md.
O. HOMMEL COMPANY, Pittaburgh, Pa.
FERRO ENAMEL CORP., Cleveland, Ohio and foreign offices
CHICAGO VITREOUS ENAMEL PRODUCT CO., Cleero, Ill.

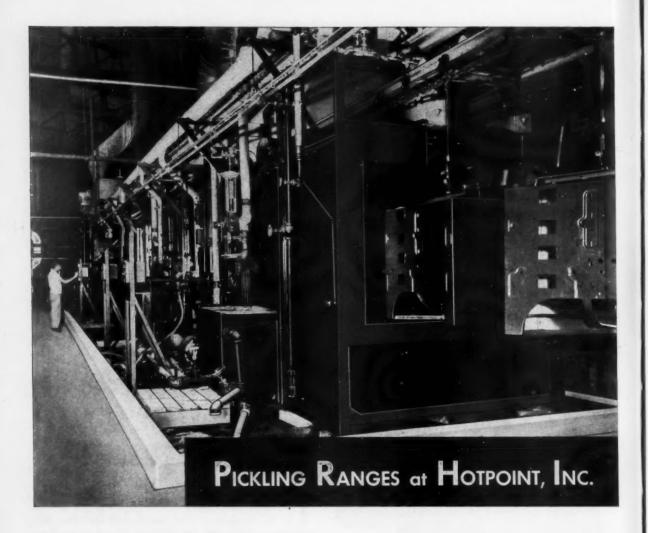
ROTOSPRAY

BRAUN CORPORATION, Los Angeles, Cal. BRAUN KNECHT & HEIMANN CO., San Francisco, Cal.

Foreign representatives WATFORD ENGINEERING WORKS, Watford, England ELOF HANSSON, Gothenburg, Sweden

ROTOSPRAYS ARE USED EFFECTIVELY IN CHEMICAL PLANTS, PAPER MILLS, AND POTTERIES

ROTOSPRAY MANUFACTURING COMPANY 562 WASHINGTON BOULEVARD • CHICAGO 6, ILLINOIS • TEL. DEarborn 2-7196



## -preparatory to Porcelain Enameling

### METALWASH Spray Pickling Machine in Action

We design and manufacture a complete line of all types of metal cleaning, pickling and drying equipment.

Write today for detailed information.

THE METALWASH Machine pictured above has been installed in the new plant of Hotpoint, Incorporated, at Chicago, Illinois.

STOVE bodies are shown going through the cleaning sequence of an alkali wash, rinse, acid pickle, rinse, nickel sulfate spray and final rinse. In each step the metal is prepared perfectly for the successive one.

THERE is no stopping of continuous production. No valuable time is wasted. The job goes through at high speed and brings each part out in excellent condition for PORCELAIN ENAMELING.

METALWASH MACHIERY CURR

149-155 SHAW AVENUE IRVINGTON II. NEW JERSEY

## A modern finishing plant for electric ranges

a completely conveyorized department incorporating the latest innovations in metal cleaning and metal finishing equipment

By E. T. Sharf . CERAMIC CONSULTING ENGINEER, AND D. M. Root . GENERAL

FOREMAN, RANGE PLANT ENAMEL DIVISION, AS TOLD TO Dana Chase



The Hotpoint electric range is completely porcelain enameled, inside and out, with the exception of range drawers,

which are finished in a silver grey synthetic enamel, and small components, such as trim rings, etc., which are chrome plated. Therefore this article will concern itself principally with the preparation of the metal for porceláin enameling, the finishing equipment, and production information relating to its operation.

In a tour of the complete Hotpoint range plant, it would be possible to

get the impression that the porcelain enameling division is small in comparison with the finishing requirements for such a high production plant. Actually, the total area incorporating the metal cleaning and metal finishing (porcelain enameling) totals just under 110,000 square feet. The complete conveyorizing of the department, combined with the use of overhead conveyor storage, automatic spray cleaning equipment, and continuous lines for all major operations, did make it possible to design a very compact finishing plant when it is compared to production capacity.

The complete plant unit is keyed for continuous synchronized opera-

tion but there is a certain degree of flexibility, resulting from the fact that all major equipment items are built to take all parts and conveyors are arranged to feed all major equipment.

For example, if we start with the pickling machines, either of the two machines can be fed from the fabrication transportation conveyor. While the double spray pickling unit is normally used for bodies which feed through the machine in a double conveyor line, the bodies can also be run through the smaller single unit pickling machine. Also, if necessary, the single-compartment machine could be closed down and all parts

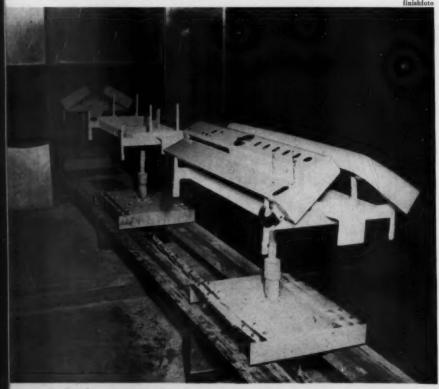
Following dipping, range oven liners move along chain conveyor through tunnel-type infrared oven. Infrared ovens of this type are used throughout the porcelain enamel plant.





Range body leaving ground coat dip tank. Man in foreground handles tilting for draining. At extreme right a range body continues over drain platform.

This photo shows the type of pin-type conveyor stands that carry ware through the cover coat spray booths, driers, and brushing rooms.



be run on the double tunnel equipment. All that would be necessary in this instance would be to change hanging tools.

There are three ground coat lines and four cover coat lines. Normally, three ground coat lines and three cover coat lines are in use, but changeover can be made here also, with some limitation, to give flexibility in production as required.

Normally, two furnaces are used for ground coat and two for cover coat firing. Here, too, it is entirely possible to close down any one of the furnaces for repairs or to control production without affecting production routine. Conveyors from both ground coat and cover coat lines are so arranged that they feed within easy loading distance of ground coat or cover coat furnace chains.

Although all lines are synchronized for continuous operation, sufficient floor space for small banks of parts is provided at strategic points to avoid production stoppage in case of a breakdown on any one line. For instance, there is a bank of cleaned and pickled bodies immediately preceding the ground coat dip line. Space is provided for approximately 100 bodies.

#### Continuous spray pickling

Two main transportation conveyors feed the porcelain enameling department from fabrication. One conveyor goes direct from the range body fabricating line to a double compartment continuous spray pickling machine. The second conveyor feeds from the back splasher, cooking top, and oven liner fabricating line to a second smaller single-compartment pickling machine.

Near the entrance end of each spray pickling machine, fabricated parts are transferred to especially designed pickling baskets for tops, back splashers and oven liners, and to especially designed hanging tools for range bodies. The special pickling baskets for the flat work are constructed of 3/8" Monel rod and are built to carry tops and back splashers in sets of four each. Another type of basket takes four oven liners. Bodies run on two parallel conveyors

through the larger double-compartment pickling machine. The tank lines in the machine consist of two cleaners, cleaner rinse, acid, acid rinse, nickel and two neutralizer tanks, totaling eight. The total cleaning and pickling cycle is 22 minutes.

#### **Enamel preparation**

The mill room is located in the extreme corner of the enameling department which also happens to be the extreme corner of the complete range plant and immediately adjoins a railroad spur. An elevator carries frit and other raw materials direct from cars to a second floor storage room, from which all mills are loaded through stainless steel chutes.

There are eight mills in all, including five 5000-lb. production mills, three of which are for ground coat and two for cover coat. There are two 1000-lb. auxiliary mills and one 300-lb. experimental mill.

Thirteen 1200-gallon tanks and two 500-gallon tanks provide storage for liquid enamel. These are all overhead tanks and are made of stainless steel. All tanks are provided with agitators which run approximately six minutes out of every 30 minutes.

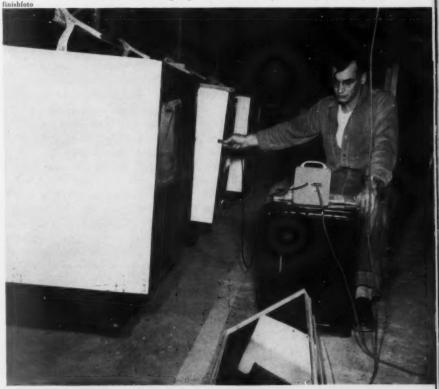
Ground coat enamel is unloaded by gravity into a stainless steel unloading tank, then pumped to overhead storage. The enamel then flows by gravity through a centrifugal sieve and magnetic separator to the ground coat tanks which serve the production line.

Cover coat is also unloaded by gravity into stainless steel unloading tanks and then pumped through a closed type magnetic separator to overhead storage. Cover coat flows by gravity through a second magnetic separator and centrifugal sieve. (Double magnetic separation on all cover coat.) All cover coat goes into 60-gallon pressure tanks which are trucked to the application lines. Specific gravity and fineness checks are made from every mill before unloading. Fired samples must also be okeyed. In addition to the mill check, a control check on each pressure tank is taken to check against error with a fired sample being employed in each instance.



Back splashers are shown entering a brushing room following drying in infra-red oven. Brushers use high speed brushing for many operations.

Inspector at finish coat furnace chain inspection point checks enamel thickness with electric thickness gauge. Note mirror for "toe plate" inspection.





Plant compactness can be judged by the activity in this photo. At left raw steel bodies enter pickling machine. At right are long furnace chains (cover coat below. ground coat above) which travel from furnace room to enameling room in background. Beyond the furnace conveyors is a conveyor leaving the exit end of the single compartment pickling machine.

#### Ground coat application

As range bodies leave the doublecompartment automatic spray pickling machine, the conveyor carries them direct to a point near the ground coat dipping line. There is space at this point for floor storage of approximately 100 bodies. At this point a helper loads the range body on an especially designed dip conveyor, which passes over two 600gallon ground coat dip tanks sunk in the floor. Two operators work on ground coat dipping, one operating the automatic conveyor dipping device and the second, tilting and draining. (Continuous circulation of the ground coat in the dipping tank is provided by a circulating pump, closed type magnetic separator, and screen.) Bodies dipped in tank No. I drain into the second tank and this slip is circulated through a magnetic separator and screen into the first tank. Dipped bodies continue over a drain platform to a continuous drier.

When back splashers are dipped, they are placed on a dolly turntable conveyor at the proper drain angle. An operator then removes all drain marks by using a thin slip, applied through a special gun, around openings. As this type of ware approaches the drier, an automatic "whodunit" turns the ware from the draining

position to the horizontal position for its trip through the ground coat drier.

All dipped parts go through a Utype infra-red drier and on the return trip the conveyor passes through a 25-foot reinforcing booth (two operators—one for tops and one for back splashers). The return loop of the conveyor then comes within easy transfer distance of the furnace chain. This method also applies to bodies and other parts.

#### Ground coat firing

Two electrically heated hump-type continuous furnaces handle ground coat firing. Firing zones are 62 feet. Ground coat is fired at 1540° F. at a 17-foot chain speed.

Tooling for bodies consists of a T-bar with two suspension bars designed to hook readily over the T-bar. Tooling for back splashers consists of a pin type rack designed to support the part properly to prevent distortion. A single hanger holds two back splashers on the top pins and two range tops, one on each side of the fixture. Oven liners are loaded two to a fixture with hanging straps provided to position the liner.

Extremely long furnace conveyor chains travel direct from the application conveyor lines so that no intermediate transfers are necessary.

#### Cover coat application

Zirconium opacified enamels are used for bodies, applied in one coat over ground coat. Titanium opacified enamels are used for tops and back splashers, also in one coat over ground coat.

Thickness of enamel coating is checked with an electric thickness gauge, both before and after firing. In checking finished enameled parts with the electric thickness gauge, parts over 18 thousandths in titanium enamel and over 25 thousandths in zirconium enamel (fired thickness) are rejected.

All parts are sprayed in enclosed pressurized spray rooms. Storage barrels are kept outside the spray rooms for cleanliness and convenience of replacement.

Loop

coat

(in

In ti

righ

loop

can

the

nace

Con

labi

spra

All spraying is done on pin-type conveyor stands, mounted on a floor-type chain conveyor. The spray conveyor carries the parts through spray rooms, driers, brushing rooms, to the furnace chain. Only two types of conveyor stands are required, one for bodies and one for tops and back splashers.

## Infra-red driers for both ground coat and cover coat

The continuous driers for both ground coat and cover coat use 120V type R40 infra-red lamps as the heat

H-42

source. All driers are equipped with exhaust fans for proper circulation and to eliminate excess moisture. Average drier length is 70 feet.

#### Cover coat firing

the

om

ors

The two electrically heated humptype furnaces used for firing cover coat are identical to those described in connection with ground coat firing. All four furnaces are housed in a room separated from the enamel application section, except for large sized conveyor openings in the separating wall. All heat control equipment is mounted on this wall and completely enclosed in two instrument control rooms as a protection against unnecessary exposure to heat and dust.

#### Kinks and quirks

The following brief bits of processing information should be of interest to the practical enameler and some may suggest ideas that are not commonly used.

When loading mills from the second floor frit storage room, each frit bag is air-cleaned in a booth before the frit is dumped into the mill loading chute. As the conveyor chain for oven liners arrives at the dipping station, the operator dips a liner and hangs it in drain position. After the liner has passed through the infrared drier, it goes through an especially designed automatic tipping arrangement which changes its position so that the open end will be toward the operators in the strippling and reinforcing booth. Here one man stipples and another reinforces. After it leaves this booth, the liner automatically tips back into its original position to make it convenient for the transfer to the furnace chain.

All parts go from enamel application to firing without changing conveyors. Pin-type conveyors are used to facilitate brushing of flat ware.

Cooking tops are burned in reversed positions for ground coat and cover coat. These parts cannot be improperly hung on the furnace tools because the tools are designed so that on the ground coat furnace they fit into slots on the back splasher side of the top and tools for white fit only the front flange.

Brushing of cover coat on range surface unit hole flanges has been eliminated through the use of metal rings which are fit inside the surface unit openings on the conveyor line prior to cover coat spraying.

Cover coat spraying of bodies is done progressively with four men giving each body an extremely thin all-over application. Weight of application can be controlled within reasonable accuracy by chain speed.

Automatic guns mounted on furn-

ace conveyor framework automatically lubricate conveyor wheel shafts, eliminating the use of grease or graphite. An extremely fine spray of lubricant is applied at each complete cycle of the conveyor. This system provides adequate lubrication and tends to eliminate any black-specking from the conveyor chain.

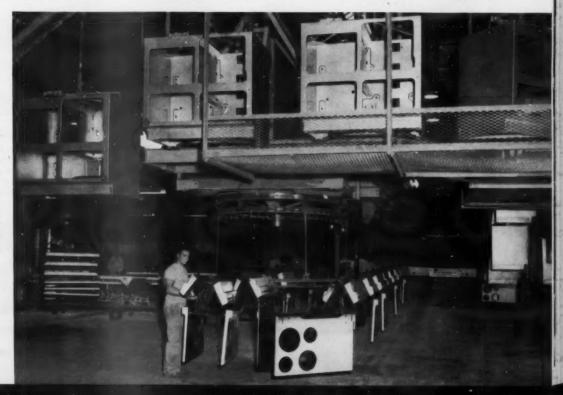
All enamel pressure tanks have individual agitators. They are loaded and checked in the mill room and delivered to the production line by electric truck.

On-the-line inspection is employed, combining visual inspection with the use of the electric thickness gauge. On the body inspection line, a mirror mounted at an angle on the floor enables the inspector to see the "toe plate" at the bottom edge of the body. All front door panels are color matched, both visually and with the photo-electric reflectance reading equipment.

As a practical color control for all parts using zirconium enamels, a light dust coat of "stabilized enamel" is applied to all parts at the end of the finish coat application line. This is a very thin application in the nature of the so-called "dust coat" of acid resisting enamel which has commonly been applied to many products. This "stabilized enamel"

to Page H-54 ->

Loop end of the finish coat furnace chain (in enameling room). In the background, at right angles to the loop, the same chain can be seen leaving the point in the furnace room visible in the preceding photo. Conveyor at top of photo is transporting fabricated bodies to spray pickling machine.



HOTPOINT chooses ISLAND "UNITIZED CONVEYOR TABLES"

World's largest Electric Range plant



keep your merchandise moving-with

## ISLAND CONVEYORS

- Floor-to-floor movement
- Assembly, inspection and packaging
- Platform-to-truck loading
- Boxcar-to-siding unloading
- Tier-to-tier stacking
- Overhead carton conveying
- COMPLETE PLANT CONVEYOR SYSTEMS



PORTABLE CLEATED BELT BOOSTER. Heavy duty Spot Con-

LIGHT DUTY CONVEYOR TABLE with Roller Bed.

Bulletin FP-27

Bulletin P-A5-1A-1



AT YOUR SERVICE . . . **Our Conveyor Specialists** and Engineering Department will make time studies, layout prints and submit quotations for your approval.

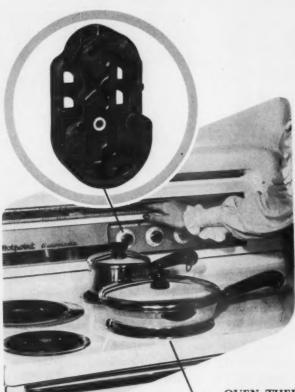
Write for Descriptive Bulletins

ISLAND EQUIPMENT CORPORATION 27-03 BRIDGE PLAZA NORTH, LONG ISLAND CITY 1, N. Y.

## TWO VITAL Hotpoint PARTS

IMPELLER FOR AUTOMATIC

DISHWASHER — Richardson ability and experience were important factors in producing this intricate molded part for Hotpoint Automatic Dishwashers. Precision molding was important to produce a perfectly balanced impeller for high-speed rotation during the washing, rinsing and drying cycles. This Richardson-molded impeller has a smooth finish, requires a minimum of finishing and fabricating operations and is impervious to water and soaps or detergents.





OVEN THERMOSTAT BASE

Richardson knowledge, facilities and skill produced this intricate Bakelite thermostat base for oven controls on the Hotpoint Range. The metal insert is accurately positioned. The electrical and mechanical properties of this Richardson-molded part undergo precision tests following assembly.

Send specifications or blueprints . . . learn, without obligation, how Richardson facilities and services might go to work for you.



The RICHARDSON COMPANY

GENERAL OFFICES: LOCKLAND, OHIO

FOUNDED IN 1858

Sales Headquarters: MELROSE PARK, ILLINOIS

CLEVELAND . DETROIT . INDIANAPOLIS . WILWAUKEE . NEW BRUNSWICK. (N. J.) . NEW YORK . PHILADELPHIA . ROCHESTER . ST LOUIS

finish october • 1949

H-45



Hotpoint's new Milwankee plant where Water Heaters are manufactured





#### WATER HEATERS PACKED IN GENERAL WIREBOUNDS

Hotpoint speeds production with General Engineered Shipping Containers. Above scene, taken in Milwaukee plant, shows Hotpoint Water Heaters being packed in General Wirebounds-right on the production line. Note that the product and the container move down the assembly line together.

Also, note that the Wirebound closures provide for quick, easy packing and unpacking. This lightweight, compact, sturdy shipping container was designed by our Laboratory especially for this HOTPOINT product. You, too, can substantially cut your packing and shipping costs. Write us for details-write TODAY!

engineered containers for every shipping need | ★ ★ ★ ★ | GENERAL OFFICES:

514 N. Dearborn St., Chicago 10, III.

DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon. Continental Box Company, Inc.: Houston, Dallas.



## HOTPOINT tops it off with FIBERGLAS"...

The final touch in keeping Hotpoint kitchens cool is a heavy, fleecy blanket of Fiberglas Insulation.

And it's tops too in Hotpoint water heaters and refrigerators.

Hotpoint, as well as other leading appliance manufacturers and Mrs. Appliance Buyer, all recognize the added values in Fiberglas ... the top quality appliance insulation.

Fiberglas points with pride to its part in this most modern Hotpoint production line bringing better products for better living to everyone.

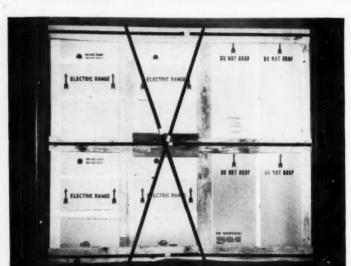
For complete information on Fiberglas Insulations, write Owens-Corning Fiberglas Corporation, Dept. 851, Toledo 1, Ohio.



\*Fiberglas is the Trade Mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for products made of or with glass fibers.

APPLIANCE INSULATION

# EVERY CARLOAD SHIPPER CAN BENEFIT FROM THE HOTPOINT STORY



This half-carload of Hotpoint Electric
Ranges has been easily and
effectively braced with Acme Unit-Load
Band. Hotpoint has used Acme
Unit-Load Band in such applications
for many years.

## Protect your shipments against shocks in transit with Acme Unit-Load Band

Acme Unit-Load Band, tensioned and securely sealed around half-car units of freight, assures safe delivery for Hotpoint Electric Ranges. It speaks well for the efficiency of a load-bracing method when it is used for such products as porcelain-enameled appliances.

Practically every product shipped in carload lots can be similarly protected — quickly, effectively and economically.

Acme Unit-Load methods result in lower freight bills (less tare weight), reduced bracing costs, elimination of damage claims, and decreased loading time. Consignees merely snip the steel bands to unload a damage-free car with a minimum of time and effort.

Users of Acme Unit-Load Band — representing every industry — report savings ranging from several dollars a car to \$30,000

annually. And this in addition to the assurance that shipments will reach their destination in perfect condition!

### Let an Acme Shipping Specialist help you!

Many users of Acme Unit-Load Band developed their present shipping methods in cooperation with an Acme Shipping Specialist. One of these field representatives, with many years experience in helping deliver the products of the nation safely and economically, will be glad to help you solve your shipping problem. There is no obligation. If you have a shipping problem, bring it to us. Just phone, write or wire Department FI-109, 2838 Archer Avenue, Chicago 8, Illinois.

STRAPPING DIVISION

#### ACME STEEL COMPANY

NEW YORK 17

ATLANTA

CHICAGO 8

LOS ANGELES 11

## Handling, crating and shipping for safe delivery

mechanical handling, packaging and shipping must be keyed to deliver the finished range from the assembly line to the kitchen of the ultimate user

By John G. Borson • traffic manager, and Edward Zelinski • packaging engineer



Mechanical handling at Hotpoint involves the use of some seven miles of conveyor lines. All conveyor lines are designed

to feed systematically to consecutive operations and lines for finished parts converge at the assembly department, which consists of four main assembly lines.

Here, on-floor type roller conveyors, the range begins to take its final form through the assembly of all components, the addition of insulation and the installation of the elec; trical system. Final assembly line inspection and electrical heat tests are also conducted on the assembly lines

Practically every type of modern conveyor equipment is employed in some part of the Hotpoint plant. The types include wire conveyors for heat treating, belt conveyors, laid down motor-driven roller conveyors, gravity roller conveyors, miles of overhead monorail conveyor, on-the-floor chain conveyor for carrying ware supports in the finishing department, heat-resisting alloy conveyors for high temperature furnaces, etc.

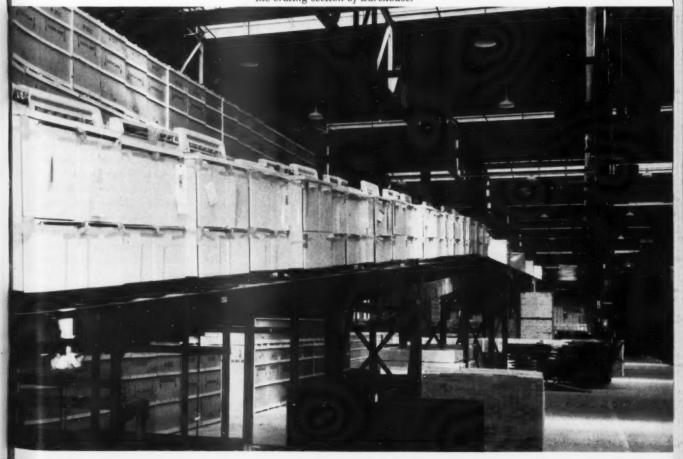
With all these seven miles of con-

veyor equipment, there is still use for a worthwhile number of electrical lift trucks for transportation within the various departments, as well as cranes for handling raw steel and finished packaged ranges in the warehouse.

## The final trip from the production plant

As a finished, inspected range reaches the end of one of the four production lines, it is lifted in an automatic elevator to an overhead conveyor line which transfers it from the production building, over in-plant railroad spurs, to the crating section

Motorized roller conveyor carries finished ranges from the production plant, over in-plant spur tracks (right), to the crating section of warehouse.





One of four final assembly lines. At this end of the lines (foreground), an elevator lifts individual ranges to overhead transportation conveyor.

First operation in crating section is addition of a corrugated fibreboard "cap" around the folded back splasher and the top edge of the range.



of the large warehouse and shipping building.

### **Preliminary packaging**

After final assembly and testing, the range is ready for the preliminary packaging details that can be handled on the production line. First steps for preparing the range for safe arrival take place on the assembly line before it leaves the production building. First of all, the range rides along the assembly line on a wooden platform or skid, which later becomes the base of the completed crate.

Small parts, such as broiler pan assembly, oven racks, etc., are carefully packed and stowed in the range interior. Cellulose pads are used at vulnerable points as a protection against breakage. For instance, a pad is placed around each open corner of drawers and doors to afford shock protection. An especially designed metal clip is also used with a pad to protect the surface units during shipment. The generous use of pressuresensitive tape on the exterior of the finished range, has done much to prevent damage to surface heating units, doors, drawers, and to the exterior finish. This tape is used to hold the wrapped deep-well cooker in place, and to prevent the opening of all doors, and drawers.

#### Back splasher design aids in packing, too

While there are many practical reasons for the use of the special back splasher, including the electrical control unit on the Hotpoint range, this special design with hinged back splasher is of great importance from the standpoint of crating and shipping. By being able to "turn down" the 10" high back splasher, the overall shipping height of the range has been reduced from 54" to 48" and as a result two tiers of crated ranges can be stowed in a railroad boxcar as against only one tier if the back splasher were not hinged. The present range, when crated for shipping, is 48" high, 44" long x 31" wide.

After a range crosses over from the production building on a roller conveyor, it continues down a long incline of the conveyor to the crating section. An inspector has been placed at this transportation conveyor, at a place where the conveyor is at or above eye level. He checks the front and sides of the range and this inspection point is particularly effective for the lower edges of range parts.

The first operation in the crating section is the addition of a corrugated fibreboard "cap" around the folded back splasher and the top edge of the range. One operator places the fabricated parts around the top of the range and holds them in place with a simple "jig" while a second operator applies a single ½" steel strap around the complete circumference of the top.

Following this operation, the four sides and top of the combination wood and corrugated closed type crate are applied progressively.

## Structural strength permits stacking five high

The completed crated range continues on the conveyor feeding shorter conveyors at right angles into bays of the large storage room or direct to railroad cars on the two in-plant spur tracks. While the majority of the ranges are shipped by rail, equally accessible facilities for truck loading are available.

For stacking in the high-ceiling warehouse, an overhead crane is used and the structural strength of the crates is such that they may be safely stacked at least five high. This is a practical test in itself for structural strength of the packaged product.

#### Carloading practice

As indicated earlier, ranges are stacked two high in cars and they are stowed three to the width of a car. The standard 40' car will take 60 ranges, but we use a 40' x 9'2" wide car whenever possible and with our present method of "staggered" loading, we can load 68 ranges to a car of this size. As a description of "staggered" loading, instead of loading all ranges with faces parallel to the car sides, we now load two ranges in each tier parallel to the car sides and one range at right angles to the car sides. This accomplishes two things - it gives us the 68-range carload and also minimizes the space between the load and the car sides. This has been cut down to approxi-



In the warehouse, hand trucks are used for both truck loading and railroad car loading. Ramp facilities accommodate seven trucks.

An overhead crane (operator is not shown in photo) is used for stacking crated ranges in the plant's large warehouse.



# PROTECT THOSE VALUABLE FINISHED PRODUCTS With the Right Box or Crate

NAILED OR HINGED CORNER

PLYWOOD CRAVENEER WIREBOUND

BOXES OR CRATES

Consult with our packing engineers on product protection — Our designing and testing laboratory is at your service, without obligation.

CHICAGO MILL AND LUMBER COMPANY
33 South Clark Street Chicago 3, Illinois

Plants at: Helena, Ark. . Greenville, Miss. . Tallulah, La. . Rockmart, Ga. . Chicago, Ill.

mately 1½" on each side of the load. Another result of this reduction in space is that it greatly reduces the angle of the steel banding used to secure the load.

We formerly used a "floating" load, but during the time that good cars have been hard to get, we changed to an "anchor" load. The "floating" load is a good system, but it requires good car floors with no breaks or obstructions. During some elaborate tests that have been conducted in connection with carloading methods, our test cars showed that with the "floating" load, an unusual impact of say 8 to 10 miles per hour, could shift the "half load" up to five feet. As will be evident, such a shift could completely wreck crate bottoms if there were imperfections or obstructions in the car itself.

#### **Bulkhead and strapping methods**

One and one-half inch strapping (.031 or .035) is used for loading. Straps are anchored at ten points at each end of the car, using standard anchor plates. These anchor plates are placed midpoint from the door to the end of the car and, of course, on a car stud. When sealed, they form five bands supporting the half-car load. Three bands are horizontal and the remaining two form a cross on the face of the bulkhead.

Wooden bulkheads, consisting of four vertical members, three horizontal members, and a 36" reinforcing member at midpoint of the center horizontal are used. All members are 1" x 6" group four lumber.

In a highly conveyorized plant it may seem unusual that we use hand trucks for carloading In this connection, consider first of all that the ranges come by conveyor to within from 10 to 25 feet of the car door, so that the remaining distance for trucking is small in every case.

The lips of the hand trucks are cut out in the center so that they actually make a "fork" truck to reach under the crated range without the trucker raising the edge from the floor.

In loading the second tier of ranges in a car, the trucker does not allow the range to tip to the floor. Instead, the range remains tipped in the truck-



This photo shows method of bulkheading and strapping in a "standard" car. This half-car load is ready for shipment with the 8-member Bulkhead and 5-strap anchor. Notice proximity of end of warehouse conveyor to loading door.

ing position and the trucker and the car checker ease the crate from the truck to a low portable platform, from which it is easily tipped onto the lower tier. With a maximum total of 68 units per car to load, we have found that the hand trucks are the most efficient method.

## Safe Transit testing methods employed

Hotpoint was one of the first to adopt the National Safe Transit Program of pre-testing packaged appliances before releasing them for shipment.

We have an engineer whose sole responsibility is to conduct the standard Safe Transit tests on all of our major appliances. On the range, for instance, we have conducted the specified tests, using the vibration machine and the Conbur incline-impact tester. In addition, it is standard practice to take a range from the crating conveyor line periodically and subject it to the standard testing procedure.

This plan has brought to light a number of important facts in relation to our packing procedure. It has also enabled us to make definite constructive suggestions to the design engineering department.

Our experience with the Safe Transit testing plan would indicate that it more than justifies the investment required to install the equipment and procedure.



IN a production set-up capable of 2400 ranges per 16 hour-day, as is Hotpoint's, complete reliability of supply is absolutely essential. In war and peace, we at Accurate have prided ourselves on our ability to keep a steady flow of springs moving into our customers' plants on schedule to forestall costly production line disruptions.

Of equal importance is Accurate's exact conformance to specifications. By using the most modern methods and the latest precision springmaking machinery we are able to mass produce your spring requirements at minimum cost without sacrifice of quality.

Plan now to find out how Accurate's springmaking "know-how" and facilities can solve your spring problems and save you money in the long run, too. Call your nearest Accurate representative or write direct.



A dependable source of supply!

ACCURATE SPRING MFG. CO. 3839 W. Lake St. • Chicago 24, Ill. Springs, Nice Forms, Stampings

## A modern finishing plant for electric ranges

(Continued from Page H-43)

has tended to eliminate much of the color-matching problem related to range production.

It would be impossible to detail all of the processing information related to the operation of a finishing plant of this size in one brief article, but we have attempted here to list the production highlights of a plant designed to "feed" the world's largest electric range producing plant.

## Chrome plating and synthetic finishing

THE equipment for chrome plating trim rings for electric range surface units is fully automatic and processes the work through the various cycles of cleaning, plating, rinsing and drying. The direct current supply is obtained from rectifiers with suitable manual regulating devices and indicating voltmeters and ammeters. Automatic temperature control is provided on all heated tanks.

The plating set up consists of 9 individual tanks and a drier compartment. This machine is an endless over-head conveyor type, chain driven with chain and 4 sprockets to form a box or station over each tank. At each of these stations, the pickup pin on the chain lifts the carrier up and out of the previous tank and lowers it down on the conveyor.

There are 27 plating carriers on this machine and these carriers are made of bronze and brass with slides so that they may ride on the bus bar which carries the current to the electric cleaner tank and the chrome tank. Each carrier transports two plating racks, which are of the hook type and are made of copper and copper contact tips. These contact tips are arranged for three point suspension so that there is a perfect contact between the trim ring and the plating rack. Each plating rack will support 6 trim rings or 12 trim rings per carrier.

The operating cycles of plating trim rings are as follows:

- The trim rings are hung on the plating racks at the start of the operation.
- They are conveyed through the alkaline spray wash for 4 minutes, 15 seconds, at 160° to 180°F.

- The electrolytic cleaner tank for 27 seconds at 160° to 180°F with a charge of 4.5 to 5.5 D.C. volts and 100 amperes.
- The cold water rinse tank for 22 seconds.
- The neutralizer or acid dip tank for 20 seconds.
- The cold water rinse for 22 seconds.
- The chrome plate tank for 1 minute, 30 seconds, with the solution at 132°F. and the voltage set at 4.5 to 5.5 volts and 400 amperes.
- 8. The dragout recovery or chrome reclaim tank for 18 seconds.
- 9. The final cold water rinse for 3 minutes, 33 seconds.
- 10. The hot water rinse for 22 seconds. (This tank is not used.)
- 11. The dryer which is circulated hot air for 3 minutes, 17 seconds.
- Unload the plated trim rings from the plating racks and pack in No. 3 cans.

The thickness of the chromium on the finished trim ring shall be from .00001" to .000015".

Since the timing of all operations is fixed by the speed of the entire plating machine, it is essential that the chemical composition of the various solutions be carefully controlled. The following ten items are listed for checking before the plating machine is placed in operation.

- In order to plate properly the parts being plated must have a high lustre.
- Proper cleaning of parts prior to plating.
- 3. See that sprays and pumps are working.

to Page H-56 ->

# Hotpoint Glidden

FOR MORE THAN 25 YEARS



## THE PRODUCTION OF FINER APPLIANCES TYPIFIED BY THE NEW HOTPOINT RANGE

The announcement of the revolutionary new Hotpoint Range marks another point of progress in the history of Hotpoint, Inc.

We of Glidden are proud of the part we have played in this progress. For over 25 years, Nubelite Industrial Finishes and Glidden Technical Service have solved a wide variety of Hotpoint's finishing problems.

We value highly this long-term relationship and rededicate our facilities and services to its continuation.

NUBIAN PAINT AND VARNISH COMPANY CHICAGO 39, ILLINOIS

DIVISION OF THE GLIDDEN COMPANY
National Headquarters • 11001 Madison Ave., Cleveland 2, Ohio

Factories and Sales Offices in: Chicago (Nubian Division), Cleveland, Reading, Pa.; Minneapolis, New Orleans, St. Louis, San Francisco. In Canada: The Glidden Company Limited, Toronto, Ontario. Sales Offices in: Atlanta, Boston, Los Angeles and New York City.

Nubelite



take your problem

★ MAKERS OF NUBELITE • BOMBAY BLACKS • SPATTERLOID • SPATTERTONE AND OTHER FAMOUS INDUSTRIAL FINISHES

finish october . 1949

New Hothoint Electric Range

with Pushbutton Controls

H-55

#### → from Page H-54

- Check temperatures of alkaline spray wash, electrolytic cleaner and chrome tank.
- 5. See that the electro cleaner tank is working and the current is on.
- The acid dip tank should read between 6 and 7 on the hydrometer, although 5 is permissible.
- 7. After parts are out of this acid dip, they should be clean.
- Chrome tank should be up to specification and the temperature of the solution should be definitely 132°F.
- The final rinse tank should be clean to eliminate chromic acid

stains on the trim rings.

10. See that the dryer is in operation.

#### Synthetic finishing on range drawers

The range drawers are the only major components of the Hotpoint range which are not porcelain enameled. These get an attractive finish of "silver grey" synthetic baking enamel.

As the drawers leave the fabricating and welding line, they go immediately into a six-stage washer. The last stage of this machine applies a phosphate rustproofing.

The same conveyor then takes the

drawers through a dip tank for the application of the grey synthetic dipping enamel. (The open dip tank is equipped with foamite fire protection.)

The conveyor then ascends through the roof of the plant to a "on-theroof" baking oven. The finish is baked at 350 degrees Fahrenheit for 30 minutes.

The conveyor then returns to the plant floor level and the drawers leave this conveyor for the first time since leaving the welding line.

Inspection follows and all okeyed drawers are carried by transportation conveyor to assembly.

## A contrast -- 1909 and 1949

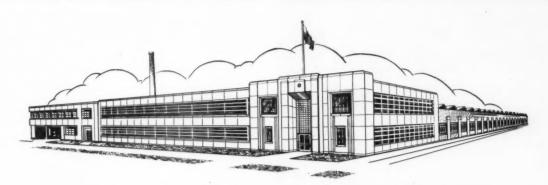


THIS special Hotpoint section of finish commemorates the fortieth anniversary of the electric range industry. It has produced approximately 8,000,000 ranges since the first electric cooking device was manufactured in 1909 by the late George A. Hughes. Today, 32 electric range manufacturers provide profit opportunities for more than 50,000 dealers and distributors throughout the nation.

The industry's electric range output was 7,500 units in 1918. In contrast to this, a volume of more than 1,000,000 units has been produced for each of the last three years.

The accompanying photograph shows the 1909 Hughes range. The Hotpoint pushbutton model of 1949 can be seen on page H-60. In the early 1900's, mealtime meant chopping wood or lugging coal; today's housewife can cook an entire meal by setting a timer and touching a button.

The entire electric appliance industry can be rightfully proud of the strides that have been made during the last 40 years in providing the American housewife with finer, cleaner, more efficient, and more beautiful appliances for the home.



## PHEOLL MANUFACTURING COMPANY

**5700 Roosevelt Road** 

Chicago 50, Illinois

#### SUPPLIERS OF

MACHINE SCREWS
TAPPING SCREWS
WOOD SCREWS
CAP SCREWS
SET SCREWS
THUMB SCREWS

STOVE BOLTS
MACHINE BOLTS
CARRIAGE BOLTS
LAG BOLTS
SPECIAL SCREWS
BRASS WASHERS

MACHINE SCREW NUTS
SEMI-FINISHED NUTS
WING NUTS
CAP NUTS
KNURLED NUTS
THREADED RODS

PHILLIPS RECESSED HEAD SCREWS & BOLTS

SEMS (LOCK WASHER SCREWS)

SPECIAL COLD HEADED AND THREADED PRODUCTS OF EVERY DESCRIPTION

## CAN WE FIT INTO YOUR



## PICTURE?

We think we can! ... We have been in

# HOTPOINT'S PICTURE

Since 1932 producing

MEMBER



Quality castings for Quality products

"Make It Better With Gray Iron"

## CHICAGO FOUNDRY COMPANY

2028 North Major Avenue

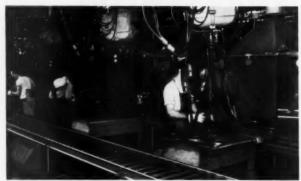
Established 1905

CHICAGO 39, ILLINOIS, U.S.A.

finish october . 1949

H-57





SAMUEL OLSON MFG. CO., INC. 2435 Bloomingdale Ave., Chicago 47, Illinois

## OLSON CONVEYORS

Point-to-point continuous material flow is essential to efficient, economical production. The ability to keep materials and parts moving from receiving to stock ... from one operation to another . . . from manufacture to shipping . . . can easily mean the difference between profit and loss.

Olson conveyors are in daily use by hundreds of America's leaders of industry. A good example is the Olson installation (a small part of which is shown herewith) in the plant of Hotpoint, Inc., in Chicago.

Olson equipment includes every type of conveyor, elevator and chute for continuous material flow. Whether it's a single unit or a complete system . . . a combination of standard and custom engineered units . . . it is tailored to meet your specific handling problems.

Call Olson today. Get the details on really efficient handling through continuous material flow.



## For HOTPOINT and for YOU

## KRAFT offers

- · SERVICE
- · QUALITY
- REASONABLE PRICES

PHONE SEeley 3-8676



For plating - for porcelain enameling - for all your chemical needs - call Kraft. You will get quick service, products tested for quality, and the right price.

Order in any quantity, large or small, and in single or mixed shipments. We carry ample warehouse stocks.

USE KRAFT NICKEL SALTS

KRAFT CHEMICAL COMPANY

917 W. 18th Street

Chicago 8, Illinois



## **Trane points to Hotpoint**

A million square feet of factory is tough to heat. Particularly when it's crisscrossed by moving production lines, all at various levels.

That was the headache faced by builders of the huge new Hotpoint Chicago plant—world's largest range plant—where "pushbutton" ranges tumble out at a record rate. And that was how Trane equipment came into the picture.

Trane projection unit heaters—some 90 of them—were mounted at varied heights in the vast building. Some are 30 feet high to gain clearance from all production lines.

These Trane down-blow units are designed especially

for high mounting. They clear all cranes and other production equipment, and at the same time salvage heat usually lost near the ceiling. Practical . . . effective . . . economical to install and to operate.

Thus was a tough problem solved—by the same equipment which makes air more efficient, more comfortable, more usable in thousands of offices, stores, plants.

Heating a factory may not be your problem. But, if it has to do with air—Trane engineers know air. How to warm it, cool it, dry it, humidify it, clean it or move it. Your local Trane representative will be glad to work with your own architect, engineer or contractor.

THE TRANE COMPANY, LA CROSSE, WISCONSIN . TRANE COMPANY OF CANADA, LTD., TORONTO

Manufacturing Engineers of Heating and Air Conditioning Equipment . . . Offices in 75 Cities

Heating, power and process piping was by the P. Nacey Company, Chicago. Frank E. Moran of the P. Nacey Company supervised the project.





al Be

alulia d engi an Chi widt:

ila by al rai-

This special 60-page section, describing the world's largest range plant, was developed by finish (trade publication for the major appliance and allied metal products industries) in cooperation with Hotpoint executives and plant men. Finish editors desire to give credit to the engineers, technical men and plant operators who assisted in the development of this feature but whose names do not appear editorially.

Copyrighted in October, 1949 finish.

Printed in U.S.A.

ciety to the Institute of Industrial Engineers and Eudertelds, the Industrial Management Society and the figciety for the Advindential of Lindngshicult.

lantini

al B

I uper

alilia

eng

viel:

of ru-

molers

NEWS

V. A. Burfovs Pordelain Edudel Conferns impositions the hildition of Childes H. Gebit to the organization. Mr. Bebit (Ecolty to treliferential margeonin remember.

Each set is calibrated we hader that gibbs filters of FBH Circhbar CE29, that in a permarkent, hiloged-tohor.

Florente's stuthern for high bitchnoling

ht the gonetal rever new "Edrshall" factory o Tennelsets Florened Si plans a chaliplett new can nout long by 1101 wate

Abourding to compa the next triangeling teluipped with document

### Appointments at Alfred U.

Four appointments to the faculty at New York State College of Ceramics at Alfred University have been announced by Dean John F. McMahon.

Dr. Lawrence R. Bickford, Jr. has been appointed an assistant professor of physics.

Elmer L. Prew was appointed research chemist. He had been an industrial chemist for 25 years with several nationally known companies, including National Lead.

Louis A. Weinland, recently professor and resident head of chemistry at Champlain College, has joined the department of ceramic chemistry.

Stanley Kazdailis was appointed an assistant professor in the department of industrial ceramic design.

## Resistance Welding Institute moves headquarters

Headquarters of The Resistance Welding Institute have been moved to the Hartman Building, Warren Road at Detroit Avenue, in Cleveland, Ohio, it was announced by Lee H. Judge, Institute director.

The Institute is an educational organization established early this year by The Resistance Welder Manufacturers Association to serve as a clearing house for information on the resistance welding processes.

#### Wilson completes 50 years with General Electric

Charles E. Wilson, president of General Electric Co., has completed 50 years of service with the organization which he joined at the age of 12 as an office boy.

## Erhard heads new division of Perfection Stove



Herbert C. Erhard, formerly sales manager of Anderson Stove Company, has joined the Perfection Stove Company organization as sales manager of the firm's new Oriole and Acorn gas range divisions, according to an announcement by C. H. Foulds, vice president in charge of sales.

Associated with the gas appliances business for nearly 35 years, Erhard was with Standard Gas Equipment Corporation, former manufacturers of the Acorn and Oriole lines, for 25 years until he joined Anderson Stove early this year.

Following his graduation from Columbia University, Erhard joined the William M. Crane Co. in 1915. The Crane Company was merged with Standard Gas Equipment in 1924.

## U.S. Steel honors 50-year man

Enoch R. Davies, who started his career in the steel business at the age of 14 helping to make shells during the Spanish-American War, was awarded a 50-year service medal by U. S. Steel Corporation at a dinner given recently in his honor. An employee at American Bridge Company's Gary (Indiana) plant, Davies received the medal from R. A. Shaw, secretary and treasurer of this U. S. Steel subsidiary.

## Annual metal congress and exposition in Cleveland, October 17-21

The 31st annual Metal Congress and Exposition, sponsored by the American Society for Metals, will be held at the Public Auditorium, Cleveland, Ohio, October 17-21. Chairman of the technical session committee is Robert H. Aborn, of U. S. Steel's physical metallurgy department.

#### Pfaudler executive dies

George F. Kroha, vice president and general sales manager of Pfaudler Company, Rochester, N. Y., died August 31 at the age of 50. He had been associated with Pfaudler since 1920. In 1929, he was elected vice president in charge of publicity and sales promotion, and in 1931 became general sales manager. He was a member of the board of the Pfaudler organization, General American Pfaudler Corp., and Enamelled Metal Products Company of London.

## Water conditioning group organizes committee on engineering

At a meeting of engineering and technical representatives of the National Association of Water Conditioning Equipment Manufacturers, August 5, at the Sherman Hotel, Chicago, a joint engineering committee and three sub-committees were organized.

The following committee appointments were announced at the meeting:

C. A. Spaulding, Jr., Refinite Corporation, chairman of joint engineering committee; Fred K. Lindsay, National Aluminate Corporation, chairman of zeolite subcommittee, and G. A. Patterson, Red Jacket Manufacturing Co., secretary; Vernon Palmer, Bruner Corporation, chairman of steel tank sub-committee, and John Harding, John Wood Manufacturing Co., Inc., secretary; J. E. Dymond, Automatic Pump and Softener Corp., chairman of component parts sub-committee, and C. F. Barksdale, Calgon, Inc., secretary.

Calgon, Inc., secretary.
C. E. Russell, of Elgin Softener
Corporation, served as temporary
chairman of the meeting. He suggested that the sub-committees make
arrangements to meet about every 90
days so that current projects could be
developed as quickly as possible and

definite recommendation made to the joint engineering committee.

Herbert C. Angster, executive secretary and treasurer of the Association, stated that the work of the engineering committee is such that immediate results could not be expected. The long range effectiveness of the group depends upon the success of the joint engineering committee in creating a better technical product, Angster said.

## Six thousand expected at AGA convention in Chicago

Based on advance registration figures, some 6000 persons are expected to attend the 31st annual convention of the American Gas Association to be held in Chicago, Ill., October 17-20, according to an Association report. The general theme of the convention will be the "Gas Has Got It" slogan.

The general sessions as well as the accounting sessions, the Home Service breakfast, and the Manufactured Gas and Natural Gas Department meetings will be held at the Palmer House.

Technical Section meetings will be at the Morrison Hotel, while the Industrial and Commercial and Residential Gas Sections are slated to meet at the Sherman Hotel. Headquarters of the Gild of Ancient Suppliers will also be at the Sherman.

A strong program has been arranged by the general convention committee under the chairmanship of George F. Mitchell, president, The Peoples Gas Light and Coke Co., Chicago, and the supporting departmental and sectional committees.

Leading off on Monday morning October 17, will be a meeting of the Natural Gas Department under the chairmanship of D. A. Hulcy, AGA vice president. Major topics will include potential natural gas reserves revealed by offshore drilling and problems of regulation.

The Manufactured Gas Department takes over Monday afternoon under the chairmanship of Hugh H. Cuthrell, AGA vice president. The Association's gas production research program, which is opening new vistas for manufactured gas, will be reviewed.

In addition, such subjects as longterm load forecasting, peak load developments, and the general fuel situation, are being considered for presentation.

Three general sessions, arranged for Tuesday, Wednesday and Thursday mornings, will provide a forum for top-ranking authorities to expound their views on the most urgent problems affecting the industry's welfare. Economics, promotion, industry relations, markets, manpower, safety, pensions, and personnel are among the topics on the agenda.

Leading off the first general session will be an address by Robert W. Hendee, AGA president. Keyed to the theme, "The '49 Round-Up," Hendee's remarks will spotlight the marked progress made by the gas industry in one of the most successful years in Association history.

Frank J. Nugent, president, Gas Appliance Manufacturers Association, will then analyze the appliance manufacturers' future plans from the viewpoint of further integration with the national programs of the utilities. In his address, "Operations Enterprise," he will explain GAMA's set-up and emphasize the tremendous force which can be engendered by complete understanding of the manufacturer-utility relationship.

A mandate for more sales will be presented by Hugh H. Cuthrell, chairman, general promotional planning committee, in a talk entitled "Scanning the Planning for Sales in '50." Cuthrell will discuss the promotion and advertising plans projected and supported by the PAR Program. Coordination and timing will be the

watchwords of his message which will throw more light on the Old Stove Round-Up and other integrated national sales campaigns to be inaugurated next year.

al

fa

ti

In an address, "The Commercial Cooking Load Belongs to the Gas Industry," Frank H. Trembly, Jr., sales manager, The Philadelphia Gas Works Co., will analyze the current competitive situation, report on the activities of the Sub-Committee on Comparative Tests of Commercial Cooking Equipment, and recommend a course of action for the industry. A focal point of his remarks will be equipment improvement through the cooperation of manufacturers.

Effective methods of training technical manpower with particular reference to the gas industry will be discussed by Dr. Henry T. Heald, president, Illinois Institute of Technology.

The general session program will be rounded out with the election of officers, special events, and the presentation of AGA awards for distinguished individual and company achievement.

At one of the sessions for the operating men of the gas industry, Ernest R. Acker, a past president of both the American Gas Association and the Edison Electric Institute, will discuss the PAR Plan from the executives' viewpoint.

Applications for hotel registrations should be sent to AGA Convention Room Reservation Bureau, Room 808, 105 West Madison St., Chicago. Members are requested to choose the hotel which is headquarters for the Section in which they are most interested.

### Refrigeration and air conditioning exposition in Atlantic City, November 14-18

The 6th all-industry Refrigeration and Air Conditioning Exposition will be held in Atlantic City, November 14-18, according to an announcement by H. F. Spoehrer, Exposition committee chairman.

Sponsored by the Refrigeration Equipment Manufacturers Association, the Exposition is said to be strictly a free trade show open to all members of the refrigeration and air conditioning industry. Invitation to attend the event is open to all manufacturers, refrigeration and air conditioning engineers, service engineers, architects, consulting engineers, wholesalers, retailers, and other persons identified with the industry.

About 20,000 persons are expected to attend what probably will be the

world's largest display of refrigeration and air conditioning units, equipment and parts.

For further information, write to Sixth All-Industry Refrigeration & Air Conditioning Exposition, 1346 Connecticut Avenue, Washington 6, D. C. mer vice president of the division, recently resigned to accept the presidency of Servel, Inc.

### **Surface Chemicals appointment**

The appointment of J. W. Britton as head of its new technical service division has been announced by Charles Groff, technical director of Surface Chemicals, Inc., research and manufacturing chemists. Britton will work in the field with industrial and commercial users in the application of new products being developed in the company's laboratories at McKees Rocks, Penn.

#### **Atlas Powder appointment**

Appointment of Philip Heiberger as senior lacquer chemist of its Stamford (Connecticut) branch has been announced by G. B. Work, general manager of Atlas Powder Company's industrial finishes department. Heiberger was with R. L. Evans Associates, chemical consultants, in New York City for four years, and later was with a large eastern manufacturer of industrial finishes.

## Superior sheet steel plant sold by Borg-Warner

The Superior Sheet Steel Division plant, Canton, Ohio, has been sold by Borg-Warner Corporation to Louis Berkman Co., Steubenville, Ohio, it has been announced. Roy C. Ingersoll, president of the sheet steel division, stated that the plant had served the objective of supplying steel to Borg-Warner's different divisions during the steel shortage.

### AGA and EEI report preparation of study of financing problems in gas & electric utility industries

In a joint announcement, the American Gas Association and the Edison Electric Institute report the preparation of a detailed study of the problems incidental to the financing of the tremendous postwar capital expansion in the gas and electric utility industries. The study will be ready for publication about the time that this issue of finish goes to press.

#### Ferro Enamels exhibits at British Industries Fair



The accompanying photograph shows the booth of Ferro Enamels, Ltd. at the British Industries Fair, held at Birmingham. The exhibit is described as follows by A. Biddulph, of Ferro Enamels, Ltd.:

"On the left may be seen the model Continuous Furnace, gas fired, upon which small articles of sheet iron were fired during the Fair and included enamelled ash trays upon which visitors wrote their name in ceramic ink, which was then fired and they were able to take away the ash tray as a souvenir.

"Among the enamelled articles shown were a pressed steel bath, wash basin and lavatory cistern, refrigerator liner and hydrator pans, cooker door panels and hot water geyser body. Cast iron exhibits included parts of heating equipment in white and cream, majolica brown and in marble lustre finish."

Small furnace sections, drawings, and other materials of interest to plant builders were also included in the exhibit.

## Atlas Mineral dedicates new research laboratories

The Atlas Research Laboratories at Mertztown, Pa., were dedicated recently as a memorial to the late Maximilliam F. Wirtz, who founded The Atlas Mineral Products Company in 1892.

In an address "The Employee's Stake in Research," George L. Wirtz, president, and son of the firm's founder, related incidents in the growth of the company in the field of protective coatings, linings, acid-proof cements, rubber expansion joints for pickling tanks, etc.

The Atlas laboratories are staffed by 12 chemists and technicians under the direction of Dr. Raymond B. Seymour, technical director, and Joseph Dahle, research director.

## Kennally named president of Philco refrigeration division

Thomas A. Kennally, vice president and assistant to the president of Philco Corporation, has been appointed president of the firm's refrigeration division, it has been announced by William Balderston, Philco president. W. P. Jones, for-

#### **Estate advances Simms**

Ellsworth Simms, gas and electric range product engineer of Estate Heatrola Division, Noma Electric Corp., has been named chief engineer of the division, according to an announcement by Cecil M. Dunn, general manager. Simms has been associated with Estate for twenty years.

company, said Clawson. Bruton will direct the efforts of the sales force and the company's branch sales offices.

Hutt joined Ferro in 1935 from the Frigidaire Division of General Motors. Later in the same year he went to Australia as service director of Ferro Enamels (Pty) Australia, a branch plant, where he stayed for four years before returning to the United States. In 1946 he was named general sales manager. Hutt is a graduate in ceramic engineering from The Ohio State University.

Bruton joined Ferro in 1936 from the Detroit Vapor Stove Division of Borg-Warner Corporation. He is a graduate in ceramic engineering from the University of Illinois. He was named assistant sales manager of Ferro Enamel Corporation in 1948.

## Moffats open Australian export drive



A few days after an Ambassador range rolled off the assembly line in the plant of Moffats Limited, Weston, Ontario, Australian housewives were gazing at the gleaming model in Sydney, Australia. Photo shows the range being taken aboard a plane at Malton Airport, Toronto. Norman Moffat, right, hands way-bill to S. I. Himmelman, station manager, while J. D. McNabb looks on.

## Ferro announces appointments

C. D. Clawson, president of Ferro Enamel Corporation, has announced the appointments of Glenn A. Hutt



Glenn Hutt

as assistant to the president, and Gene L. Bruton as sales manager. Hutt



Gene Bruton

previously was sales manager and Bruton was assistant sales manager.

In his new position, Hutt will be responsible for general sales, advertising and new product sales promotion policies in all divisions of the

## Glidden establishes graphic arts and sign finishes department

Establishment of a graphic arts and sign finishes department in the Paint and Varnish Division of The Glidden Company and the appointment of Bert C. Zahn as manager of the new department have been announced by A. D. Duncan, Glidden vice president.

Author of texts on the graphic arts, including "Silk Screen Methods of Reproduction," which is used by schools, colleges and the U.S. Government, Zahn is also general chairman of the Screen Process Printing Association's first international convention which will be held in Cleveland in November.

Zahn will organize and coordinate Glidden's sales efforts in this field, maintaining headquarters in Cleveland, stated Duncan.

#### Armour Research adds to ceramics and minerals department

Dr. Einar P. Flint, chairman of Ceramics and Minerals Department at Armour Research Foundation of Illinois Institute of Technology, has announced the addition of four scientists to the department's staff.

Dr. Lewis H. D. Fraser, formerly with Owens-Illinois Glass Co., was

to Page 89 ->

**MONOTUBE\*** 



## CAN HELP SELL YOUR RANGES!

Yes, the obvious selling features of TK Monotubes represent one of the main reasons why more and more Range Manufacturers are standardizing on this really distinctive electric cooking unit.

The Monotube has everything! Exclusive "Swivel-Action" plus a single, flat coil design, plus durable, solid and simple construction. No 'trick holds" needed as the coil is swung to Down or Up positions. Here is a cooking unit that you, your distributors and your dealers can SELL!

Equally important, Monotubes can easily be adapted to your ranges without disrupting production. Get the complete facts now on this outstanding cooking unit!



The Monotube Coil is flat. And, being anchor-less, it stays flat - nothing interferes with free return to normal flatness after breathing. The flat coil insures a bigger utensil-contact area...faster heating and lower cost cooking.

## UP

for Easy Cleaning

Nothing equals Monotube "Swivel-Action" for cooking ease. When foods spill, Mrs. Housewife just swings the coil up-even when it's hot—for quick, easy cleaning of the drip pan. The coil stays up by itself—reassembly after cleaning is so simple it can be done with one hand. Yes, Monotubes are the last word in cooking convenience!





finish october . 1949

# The year that got away-



#### NEWS

> from Page 86

named supervisor of inorganic technology. Alfred W. Nutt, formerly assistant superintendent of Tuthill Building Materials Co., Blue Island, Ill., was appointed an associate ceramic engineer.

Daniel L. Deadmore, formerly an engineering trainee in ceramics at Carnegie-Illinois Steel Corporation, was named an assistant ceramic engineer. Donald M. Schell, a ceramist for Ingram-Richardson Mfg. Co., of Frankfort, Ind., was also appointed an assistant ceramic engineer.

#### **American Radiator re-opens plants**

It is reported that American Radiator & Standard Sanitary Corp. has re-opened three of its plants closed since last spring. The plants, which employ about 2000 persons, are the Baltimore Works, the Bond plant at Buffalo, and the Bayonne (N.J.). Works.

## U.S. Steel set to market low cost home

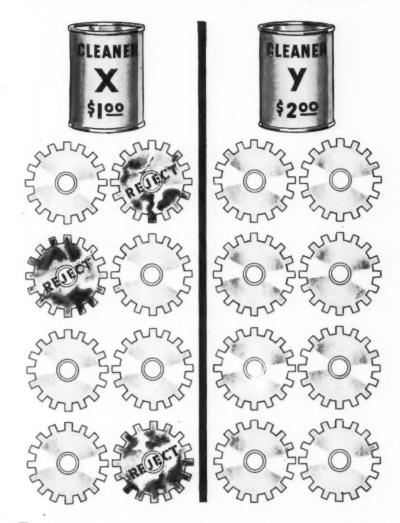
United States Steel Corporation has announced that its new pre-fabricated four-room home, which has two bedrooms, is set for immediate mass production and mass marketing through the firm's home fabricating subsidiary, Gunnison Homes, Inc. The company's new assembly-line plant at New Albany, Indiana, is geared for mass output of homes at a rate of one every 20 minutes.

### Ferro sponsors student contest for best papers on technology related to porcelain enameling

Graduate and undergraduate students in United States and Canadian Ceramic and Ceramic Engineering Schools have been invited to enter a \$1000 award contest being sponsored by the Central Research Division of Ferro Enamel Corporation.

Five prizes will be awarded for the best papers written by students on any phase of technology related to to Page 96

# WHICH COSTS MORE?



Iwo brands of metal cleaners, designed to do the same job, often produce altogether different results. One may sell for less and still cost far more to use in the long run.

Your best guarantee of economy and quality in the cleaning products you buy is the reputation of their maker. Proved cleaners help insure your products against rejects and failures in service. This kind of "insurance" pays for itself and earns big dividends for you in repeat orders and customer good-will.

Wyandotte Metal Cleaners are made by the world's largest producer of specialized cleaning compounds. Balanced Wyandotte Cleaners are made for soak, electrolytic, spray and tumble operations, as well as for degreasing, paint stripping, burnishing and burring.

All of these up-to-date products meet exacting performance specifications. Fifty-nine years of experience stand behind their Wyandotte trademark. No matter what your cleaning needs may be, it will pay you to call your nearest Wyandotte Representative. If you have some unusual problem, our skilled technical service staff will be glad to help you.

## **Wyandotte Chemicals Corporation**

WYANDOTTE, MICHIGAN
SERVICE REPRESENTATIVES IN 88 CITIES



# "YOUR ING-RICH SERVICE ENGINEER TO SEE YOU, SIR!"

Pontius Pilate is the classic example of a guy who wound up a job in a hurry, said, "Well, that's that," and went home for a Martini.

Oddly enough, some modern business firms behave the same way. They beat the drum to get you to buy their product, but once you've bought they're not interested until you are ready to buy again.

But not Ing-Rich. Selling you PORCELFRIT is only one step... the next one is being sure it's right for you. After rigid laboratory tests, after actually using it in our own enameling department—we tailor-make it to your needs by offering you the time and ability of an Ing-Rich Service Engineer to study your individual requirements and see that you get the right kind of PORCELFRIT. This costs you nothing—it's part of the Ing-Rich follow through policy which has won and held a host of friends for PORCELFRIT.



## 5 OTHER GOOD REASONS FOR USING PORCELFRIT

## 1. FEWER REJECTS

Now that we're back on a buyer's market, you have to watch your rejects. PORCELFRIT cuts them to a minimum.

#### 2. PLANT TESTING

Right in our own job enameling plant, under conditions of actual use, we use PORCELFRIT. When you get it, it's right.

## 3. LABORATORY CONTROL

Our ceramic engineers maintain constant contact with the production staff to make sure of highest quality.

#### 4. IMPROVED SMELTING

Ing-Rich uses unquestionably the world's finest smelting method, the result of exhaustive research and experiment.

#### 5. EXPERIENCE

Since 1901 Ing-Rich has pioneered in porcelain enameling. We have learned a lot in that time —and our customers profit by it.

INGRAM-RICHARDSON MFG. CO. OF INDIANA INC.

OFFICES, LABORATORY AND PLANT FRANKFORT, INDIANA

## **National SAFE TRANSIT program**

## rounds out the first year of operation

THE National Safe Transit Program has rounded out its first year of operation in the battle to reduce packaging and shipping losses on packaged finished metal products.

It was just a year ago that finish carried the report on the formalizing

of the program and the initial appointments to the National Safe Transit Committee, made by C. D. Clawson, president of the Porcelain Enamel Institute.

Progress of the program, which was initiated by finish and coordi-

nated by the Porcelain Enamel Institute, has been steady and continuous in every phase of activity due to the interest and effort on the part of active committee members and also due to the full cooperation of industry.

## SAFE TRANSIT label for certified manufacturers announced

THE accompanying illustration shows the new label which will be used by companies participating in the national Safe Transit voluntary program for the reduction of packaging and shipping losses. The labels will be supplied to manufacturers taking part in the program after certification by the National Safe Transit Committee.

Certification requires that the manufacturer actually have the pre-shipment testing equipment in his plant and pre-test in accordance with the approved standards or meet these requirements through the facilities of testing laboratories which are certified by the Safe Transit Committee.

The label is expected to serve two purposes. Packaged products bearing the Safe Transit Label will give notice to all handlers that the shipment should arrive undamaged unless given excessive abuse. This is expected automatically to improve handling conditions. The second result of the label will be to notify the dealer and final customer that the manufacturer has done the best that shipping science provides to insure safe delivery of this merchandise.

Some manufacturers have completed the installation of the necessary pre-testing equipment and certification of manufacturing companies is now under way. The first appliance manufacturers to complete the necessary steps for the use of the labeling program, as reported by the Committee are:

American Stove Company
A. J. Lindemann & Hoverson Co.
A. O. Smith Corporation

Automatic Washer Company Caloric Stove Corporation General Electric Company Geo. D. Roper Corporation Moore Enameling & Mfg. Co. Norge Division, Borg-Warner Corp. Philco Corporation Tappan Stove Company Westinghouse Electric Corp. (two plants)

# PRE-TESTED SAFE TRANSIT SHIPMENT

This PACKAGED PRODUCT meets the pre-testing standards established by the National Safe Transit Committee and will withstand ORDINARY transportation and handling hazards.

NATIONAL SAFE TRANSIT COMMITTEE



1010 VERMONT AVE., N. W. WASHINGTON 5 D. C.

0

MAKE
SAFE HANDLING
YOUR JOB!

## A message for finish magazine

By J. D. Malcolmson · VICE PRESIDENT, PACKAGING DIVISION, AMERICAN MANAGEMENT ASSOCIATION

THERE is no doubt but that the National Safe Transit Program can make a significant contribution to industry and to the national economy as a whole. It is designed both to accelerate progress in the application of improved packaging, packing and shipping methods and materials, and to reduce a major leak in our economic dike through which millions of dollars and man hours are lost annually. I am sure that those who have sponsored and implemented the Safe Transit Program will have the gratitude of the more than 12,000 company and individual members of the American Management Association. This is true because the community of interest of those of us in AMA is primarily the exchange of knowledge and experience which defines and provides a basis for the solution of such problems as the Committee has attacked so forthrightly. Perhaps you would like to know as a measure of the interest in the program of the Committee to improve safe transit of the goods of this nation, the frequency with which attention has been given to this problem in connection with AMA activities. It has repeatedly been a topic for discussion at meetings of AMA's Packaging Division. It has come up almost equally often in discussions at

conferences of AMA's Insurance Division, and it has been examined in its various aspects by AMA's Production Division and Marketing Division.

AMA deliberately avoids advocacy of any particular program in order to remain impartial and unbiased. AMA's role is to collect, analyze and disseminate information on problems confronting industry. But, as representatives of more than 400 types of industry, those of us who are active in the Packaging Industry of AMA look forward to your continued efforts and success.

## SAFE TRANSIT withstands critical observation

By Don L. Quinn . THE DON L. QUINN CO., CHICAGO, ILL.

OUR organization "takes off its hat" in admiration and respect to the Porcelain Enamel Institute for its success in formulating and putting into effect its program for an industry-wide standard method by which each member can determine for himself, before shipping, the efficacy of

his own method of packing and protecting his product in handling, in storage, and in shipping—that loss and damage may be minimized and customer good will be enhanced.

The standard itself is based on performances of the packaged item by laboratory tests. That meets our

# Sheris — Parkar Strains Sheris — Parkar Strains Sheris — Parkar — Sunda Strains Sheris — Parkar — Sunda Strains — Parkar — Sunda Strains — Parkar — Sunda Strains — Parkar — Angles L

# - NEED Heat Resisting Alloys for Enameling Fixtures?

We Have Over 200 Items of Heat Resisting Alloy Mill Forms in Warehouse Stocks Ready for You

# Send For Our MONTHLY STOCK LIST

ROLLED PRODUCTS DIVISION

Michigan Steel Casting Company

MISCO

One of the World's Pioneer Producers and Distributors of Heat and Corrosion Resisting Allays

# Skelnor Process de-enameling

First Commercial Porcelain De-Enameling Installation

Our process will save your valuable parts from the scrap pile.

De-enameled parts come back to your plant clean and ready for the pickle room — no sand blasting or "touch up" necessary.

Long experience in serving the largest producers of porcelain enameled products places the Skelnor Process *out-in-front*.

Call us in to see your rejects. We can tell you whether you can save money through deenameling.

SKELNOR METAL PROCESS Co. 3382 Avondale Ave. Chicago 18, III.

Phone Cornelia 7-3130 whole hearted approval. This principle is fundamentally sound because the laboratory can apply, under every proper control, the same stresses and strains which the packaged item must resist in handling, storing, and shipping; hence its satisfactory performance in the prescribed tests insure it has the desired factor of safety in actual service.

As a certified commercial testing laboratory, under this program, we have made the prescribed series of tests over and over again during the past several months for a number of our customers, and the methods prescribed have withstood our critical observations. Our years of experience justify our present enthusiastic approval.

The method prescribed is flexible enough to permit each shipper to modify his procedure as may be necessitated by the variability of his own product and as his own experiences dictate, and that is as it should be.

That, however, does tend to complicate the standard so far as the referee laboratories (the commercial testing laboratories) are concerned because those laboratories do not wish to modify any standard test procedure as its own experience might dictate nor as the customer might dictate, and especially since such a laboratory has to certify compliance with the standard. Experience will, of course, iron out any such complications, hence the presence of such conditions is not a serious matter.

This project certainly is a very important precedent which organized industries could well afford to consider as a project for themselves. So far as this laboratory is concerned, we certainly would urge those other organized industries to give thoughtful consideration to its merits.

### NYU offers course on "packing for safe shipment"

New York University's adult school, the division of general education, offers for the packaging profession, beginning September 30, a 15-week course entitled "Packing for Safe



WEBB

FLOOR TYPE
TOW CONVEYOR

- FAST—Operator Drops Pin In Slot, Walks Away . . .
   No Loading Time Lost.
- CLEAR FLOOR—No Obstacles . . . You Can Truck Over It Easily.
- FLEXIBLE—Can Be Routed As Required . . . Disengaged Anywhere Along The Route.

The Webb Floor Tow Conveyor is a new type chain conveyor running in a slot below the floor. Standard shop or warehouse trucks, either 2 or 4 wheel are used. The simple towing pin mechanism is bolted to the front end. Uncomplicated, easy to operate. No overhead structure to interfere with floor traffic.

From the time of its founding, 30 years ago, Jervis B. Webb Company has been identified with improvements in all types of conveyors and has pioneered many of them. Webb Overhead Trolley Conveyors, Power and Free Conveyors, Slat, Drag Chain, Belt, Roller and Portable conveyors are reducing costs, speeding production in thousands of plants and warehouses.



## Completely Enclosed Washing and Pickling Machine

Reduces Pickling Time to Less Than One-Third . . . Permits

## Vast Reduction in Volume of Processing Solutions!

Complete Spray Pickling Equipment, with positive protection for continuous overhead monorail conveyor, is now available to porcelain enameling plants.

The new Mahor. Hydro-Hermetic Seal (Patents Applied For) makes possible this noteworthy advance in the development of practical and economical equipment for the preparation of metal surfaces to receive porcelain enamel. The process is continuous through all operations.

Tanks and tunnel housing are of mild steel throughout except in areas where corrosive materials are in contact or fumes prevalent. In these areas, steel is lined with lead or rubber, or Monel Metal is employed. The monorall conveyor, which operates in the open above the machine, is fitted with Monel Metal adapters which are the load carrying medium that passes through the Hydro-Hermetic Seal—no spray or fumes can escape or work up the adapters to damage the conveyor.

The Hydro-Hermetic Seal, which seals the top of this machine throughout its entire length, greatly increases processing efficiency in each

stage. It also prevents the loss of active chemical fumes, reduces ventilating requirements to a minimum, and eliminates both the necessity for a tremendous intake of air through an open conveyor slot—hither-to general practice, and the resulting necessity for replacement of air within the building.

These Mahon Pickling Machines can be designed to meet any requirement of product processing, production rate, or plant layout.

Whatever your finishing requirements may be, whether it be Pickling Equipment, Porcelain Enamel Spray Booths, Dryers, Cleaning and Rust Proofing Equipment, or a complete Finishing System, you can turn to Mahon with complete confidence for the right equipment to do your particular job with utmost efficiency and economy. A Mahon engineer will gladly explain the many advantages of this new type Pickling plant at your convenience.

## THE R. C. MAHON COMPANY

Detroit 11, Michigan • Chicago 4, Illinois

Engineers and Manufacturers of Complete Finishing Systems—including Pickling Equipment, Porcelain Enamel Spray Booths and Dryers, Metal Cleaning and Rust Proofing Equipment, Dry-off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens. Also Core Ovens, Shrink Ovens, Bend Ovens, Hydro-Foam Dust Collectors, and many other Units of Special Production Equipment.

## PROCESSING ...

- 1. Emulsion Cleaning
- 2. Clear Water Rinse
- 3. Alkali Cleaning
- 4. Three Stage Water Rinse
- 5. Sulphuric Acid Bath
- 6. Acid Water Rinse
- 7. Nickel Sulphate Bath
- 8. Cyanide Neutralizer
- 9. Borax Neutralizer Rinse
- 10. Hot Air Dry-Off

MAHON

Shipment," it has been announced by Prof. Sidney G. Roth, in charge of the program of technical studies.

Covering a broad range of topics essential to adequate performance in industry, the course is being presented by men from industry who wish to educate large users of packing material in the proper and economic ways of safe shipment. The principal packing and shipping materials such as corrugated and solid fibre-board, wooden containers, bags and sacks, adhesives, and closures will be discussed. Specialized techniques such as container design, carloading and bracing, export packaging, work simplification, and materials handling will also be treated.

Henry J. Howlett, president, Container Laboratories, Inc., and formerly secretary of the American Man-

agement Association, will direct the course and will introduce the following guest lecturers, all prominent men in the industry:

Robert de S. Couch, General Foods; J. D. Malcolmson, 'Robert Gair Co.; Fred Meendsen, Union Bag and Paper; Frank Campins, Polymer Industries; Harry Chapin, Hinde and Dauch Paper; Alfred W. Hoffman, Container Laboratories.

Allyn Beardsell, Western Electric; C. D. Hudson, National Wooden Box Assn., Theodore Gross, packaging consultant; Edward Dahill, Assn. of American Railroads; John G. Crowell, Philco Corp.; Clifton Cox, consultant; George A. Farrah, National Container; and Burr Hupp, of Drake, Startzman, Sheahan & Barclay.

## Laboratory certification program under way

THE certification of testing laboratories is now well under way according to the latest report on this phase of the National Safe Transit Committee's activity.

Although it is expected that a longer list of laboratory names may be released soon, the names of the laboratories that were certified prior to press date for October finish are:

Atlas Plywood Corp.
Chicago Mill and Lumber Co.
Container Laboratories, Inc.
Don L. Quinn Company
General Box Company
Hinde & Dauche Paper Co.
International Paper Co. (two labs.)
Ohio Boxboard Co.

## SAFE TRANSIT loading research division is active

S announced in September finish, A M. F. Weber, traffic manager, American Stove Company, has been appointed chairman of the loading research division of the National Safe Transit Committee. Primary purpose of the loading research division is to educate manufacturers in better ways of loading and bracing their packaged finished metal products in railroad cars, trucks, and planes. The division also plans to develop placards which will identify material moving under the National Safe Transit Program, and placards which will instruct handlers of the packages in the best means of loading and unloading.

"The National Safe Transit Program, entered voluntarily by manufacturers of finished metal products, is probably the finest damage-prevention program ever attempted in this country," Weber stated at a recent division meeting in Chicago. "Packaged finished metal products which will pass the tests specified by the Safe Transit Committee will withstand all the hazards of ordinary transportation.

"The Committee's carrier-coordinating division has enlisted the help of national transportation agencies in assuring proper handling of the packaged products while in their care. To complete the job, the material must be shipped in good cars, trucks, or planes, and must be loaded, braced, and banded properly. The final step is to placard the cars or trucks so that the carrier will know it is handling material covered by the National Safe Transit Program. A thorough program such as this cannot help but result in tremendously reduced

loss and damage claims," concluded Weber.

Plans are already under way for the distribution of constructive printed information on accepted loading practices. The loading research division is currently consolidating information based on research by accredited organizations, and will later publish well-illustrated information on loading and bracing techniques which it is expected will prove to be invaluable as reference material for shippers of all types of appliances and allied products.

## Complete third SAFE TRANSIT flight test

DDITIONAL research data on the effects of air transportation on packaged finished metal products has been secured as a result of a recent test shipment by United Air Lines. Arranged by Air Cargo, Inc., in cooperation with the National Safe Transit Committee, the flight included a round trip from Cleveland to New York City. The shipment differed from the two previous Safe Transit commercial airline flight tests in that the test package was transferred by truck carrier over the local New York City delivery route to the Newark airport, making it possible to secure additional valuable data con-

cerning in-transit vibration and shock.

The test equipment consisted of a wooden box on which two RW-2 ride recorders had been mounted, one horizontally and the other vertically, so that both horizontal and vertical impact could be continuously recorded throughout the flight and subsequent handling. The entire test package weighed 70 pounds.

The total time for the test, including the truck routing and the return air trip to Cleveland, was approximately 34 hours. The time spent in delivery in New York City was 7 hours and 54 minutes. The recorder indicated a total of 25 different steps

during this transfer period. The flight route also included a stop in Philadelphia but the package was not transferred at this point.

Railroads as well as truck and air carriers are also participating in the Safe Transit testing program, and much valuable shipping data is being accumulated through these three sources. The program is sponsored by the Porcelain Enamel Institute for the purpose of reducing in-transit damage to packaged finished metal products.

## The production line ends at the point where the product is used

By H. J. Howlett . PRESIDENT, CONTAINER LABORATORIES, INC.

It will be generally conceded that the production line ends not at the door of the manufacturer's shipping room, but rather at the point of use of his product. His primary responsibility is to see that his product is placed in the hands of the consumer in sound condition, and meticulous care in the selection of materials and in the manufacturing process is futile without this end result.

Container Laboratories, Inc., heartily endorses the principles of the National Safe Transit Program, sponsored by the Porcelain Enamel Institute, as a constructive step towards

this goal. Farsighted participants in the Safe Transit Program will know in advance that their packages will ship successfully. The attitude and principles of this program might well be adopted by other industry groups with similar interests.

It is reported that Container Laboratories' Chicago branch has Safe Transit test equipment. Mr. Howlett said that the company will also install the necessary equipment in its New York and San Francisco laboratories if there is sufficient demand for the test in those areas.

#### NEWS

→ from Page 89

porcelain enameling on metal. First prize is \$500; second, \$300; third, \$100; fourth and fifth, \$50 each.

The contest will close midnight, March 15, and prizes will be announced at the 52nd annual meeting of the American Ceramic Society in New York City, April 24, 1950.

Judges are Charles S. Pearce, ACS secretary, Edward Mackasek, PEI managing director, and Dr. G. H. McIntyre, vice president and director of research for Ferro.

Dr. McIntyre said that his company is sponsoring the contest to stimulate the interest of university students in the science and technology of porcelain enameling on metals.

Rules governing the contest are available from Ferro Enamel Corporation, 4150 East 56th St., Cleveland 5, Ohio, or from any Ceramic or Ceramic Engineering School.

#### Stukel to Youngstown Sheet & Tube

John E. Stukel, Jr., former assistant professor at Carnegie Institute



## **ACROSS**

- 12 The wolf look
- 15 Sailor
- 18 The fun in football
- 21 Hot-dip metal
- 27 Skill
- 30 A soft answer

## 12 DOWN\* is the answer

\*OAKITE provides the right solution for every metal-cleaning process:

> Cleaning in tanks Cleaning in machine Electrocleaning

Steam-gun cleaning

Burnishing
Barrel cleaning
Rust prevention

Pickling

FREE For advisory service on jobs that are giving you trouble, write to Oakite Products, Inc., 17 Thames St., New York 6, N. Y.



ng you trouble, write to Oakite Products, nes St., New York 6, N. Y.

Sears Roebuck introduces new clothes dryer

A new automatic electric clothes dryer is being introduced nationally by Sears, Roebuck and Co. in the firm's retail stores. Holding up to nine pounds of clothes, this new home laundry unit performs its drying cycle automatically by means of simple temperature and time controls.

of Technology, Pittsburgh, has joined the operating department of The Youngstown Sheet and Tube Company as a development engineer. He is now located in the office of Dr. Karl L. Fetters, special metallurgical engineer, in Youngstown, Ohio.

Stukel holds a degree of bachelor of chemical engineering with distinction from the University of Minnesota and also a Ph.D. degree in metallurgy and physical chemistry. As a graduate student he held a three-year fellowship with the U. S. Bureau of Mines. Since then he was with Inland Steel Company, the Case Institute of Technology, and Carnegie Institute of Technology.

#### Fischer & Porter instrument course

The Fischer & Porter Company has announced a number of vacancies for its next instrumentation course to be held at its Hatboro (Pa.) plant, October 10 through 14.

The course will cover manufacture, calibration, installation, operation and maintenance of the firm's lines of primary and secondary process control instruments. It is designed for engineers responsible for process control instrumentation and for instrument specifications, installation, operation and maintenance, according to H. R. Holden, service manager.

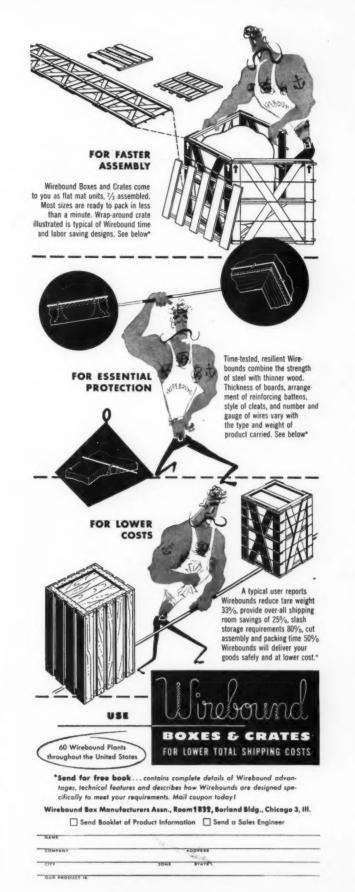
#### Bruce added to service staff at Chicago Vit

B. D. Bruce, with the firm since 1937, has been transferred from the research division to the service staff of Chicago Vitreous Enamel Product Co., it has been announced. Bruce is a graduate of the University of Illinois with a bachelor degree in Ceramic Engineering. He joined Chi Vit as a full time research laboratory assistant, assigned to quality control.

#### Brown sales appointments

Charles E. Sharp has been appointed Chicago branch industrial manager for Brown Instruments Division of Minneapolis-Honeywell Regulator Co., it has been announced by W. H.

to Page 100 ->







## The systematic approach to the development

this new dual line, semi automatic weighing system.

Whether it is a pound or a carload of a simple or intricate frit formula prescription accuracy is guaranteed. And this is but one of the newer Pemco units that combined with Pemco's Wholly Continuous Smelters permits you to plan your production runs on the basis that every single ounce will be of the same UNIFORM DEPENDABLE QUALITY. In a market that daily becomes more highly competitive Quality and production costs are a lactors. In Pemco Quality and as a result of their smooth trouble free performance your production costs are always lower.

# PEMCO CORPORATION Baltimore 24. Maryland

Always Begin With a Good Finish

#### -> from Page 97

Steinkamp, Brown field sales manager. Sharp, with the Chicago office for the past five years, succeeds J. A. Robinson, who is now regional industrial sales manager for the midwest, western and Pacific Coast areas.

## ICHAM annual convention and exhibit in Cincinnati, December 5-7

The 17th annual Convention and Exhibit of The Institute of Cooking and Heating Appliance Manufacturers will be held in Cincinnati, Ohio, at the Netherland Plaza Hotel, December 5, 6, and 7, according to an announcement by Walter F. Muhlbach, vice president in charge of conventions.

Keynote speaker at the convention will be Warren Whitney, vice president of National Cast Iron Pipe Division, James B. Clow and Sons, of Birmingham, Alabama.

Room reservations should be addressed to Miss Mary Hesse, director

of sales, Netherland Plaza Hotel, Cincinnati, Ohio.

ve

50

0

by

re

in

ha

pa

di

in

fi

### Servel names Ruthenburg board chairman and Jones president



Louis Ruthenburg

Louis Ruthenburg, president of Servel since 1934, was elected chairman of the board and chief executive officer, and W. Paul Jones, formerly president of Philco's refrigeration division, was elected president of Servel, Inc., at a recent meeting of the board of directors.

## Annual electric sign design contest, Oct. 1 to Dec. 31

The 4th annual Electric Sign Design Competition, sponsored by the National Electric Sign Association, will feature a restaurant as the problem for which \$1000 in cash prizes are to be awarded for the best electric sign treatment. The contest will open October 1 and close December 31. Winning entries will be announced on February 6, during the 1950 NESA convention, in Cincinnati.

For details of the competition, write NESA Headquarters, 224 S. Michigan Ave., Chicago 4, Illinois.

### Screen process men to stress practical subjects at first convention

All sessions, operating clinics, demonstrations and exhibits at the 1st annual convention of the Screen Process Printing Association will be keyed to the needs of screen proces-



## **Counsel Beforehand**

Better shelves at lowest cost are yours from USP because Sales Engineering Service on the part of Union Steel starts before a job begins.

Union Steel wire shelving specialists know shelving . . . can often recommend production short-cuts that result in real economies for you. And, always remembering that "Eye-Appeal" adds "Buy-Appeal", beauty in design and finish get special attention at USP.

When you select the oldest and largest wire fabricator . . . USP . . . to make your shelving you're entitled to "Counsel Beforehand". Let USP engineers and designers help you get highest quality, modern design, low-cost "On time" delivery to fit all your shelving needs.



## UNION STEEL PRODUCTS COMPANY

WIRE PRODUCTS DIVISION
Albien . Michigan

sors, according to Bert Zahn, convention chairman. The year-old association's first annual meeting will be held in Hotel Cleveland, Cleveland, Ohio, November 6, 7, 8, and 9.

For further information, write to SPPA Convention Headquarters, Box 144, Bedford, Ohio.

#### Tucker resigns from Lustron

Resignation of Joe Tucker as senior vice president and a director of Lustron Corporation has been announced by Carl G. Strandlund, president. In announcing acceptance of the resignation, Strandlund said he did so with regret and only because of Tucker's insistence.

In his letter of resignation, Tucker pointed out that the "arbitrary salary limitations placed on executives and other personnel at Lustron by its present debt, and the fact that it is improbable that management would have any participation in the anticipated profits of the operation for several years to come, makes it necessary that I return to privately financed industry where I feel certain I can again command compensation commensurate with management responsibilities."

## Whirlpool adds new features to automatic washer



Addition of three new features on its Whirlpool deluxe automatic washing machine has been announced by Nineteen Hundred Corporation, of St. Joseph, Michigan.

The innovations are a new aluminum agitator, which looks like a

piece of modern sculpture (see photo), an ultra-violet germicidal lamp, and a buzzer which sounds during the last minute of the time period for the load in the tub.

## Tagliabue Corp. appoints new district sales representatives

C. J. Tagliabue Corporation, wholly-owned subsidiary of Weston Electrical Instrument Corp., has announced the appointment of the fol-

lowing district sales representatives.

E. A. Thornwell, Inc., Atlanta; Ranson, Wallace & Co., Charlotte; Ambos-Jones Co., Cleveland; Butler & Land, Dallas; Lynn Elliott Co., Houston; Curtis H. Stout, Little Rock; Geeseka & Pinkney, Minneapolis; Joralemon, Craig & Co., Philadelphia; J. E. Redmond Supply Co., Phoenix; and Riddle & Hubbell, Tulsa.

The complete line of Tagliabue instruments includes automatic control-

# WE WILL PROVE YOU CAN REDUCE COSTS with FIBER-and-STEEL Strapping



# WRITE OR WIRE FOR TEST DEMONSTRATION

on how your shipping losses can be reduced —no obligation

Let the A. J. Gerrard packing engineers prove to you that FIBER-and-STEEL. will hold vitreous enamel stove doors or similar vitreous enamel products in a better non-vibrating position during shipment and will end your claims and complaints due to chipped enamel surfaces. Uncrating is easier and there are no adhesive stains with FIBER-and-STEEL.

FIBER-and-STEEL is strong. It is a combination of steel strapping and soft,

weather-proofed Kraft paper. It is secured with a soft aluminum Gerrard seal. Demonstrations are now being scheduled among stove manufacturers and builders of vitreous enamel

products. Write or wire so that you, too, can get information on how to reduce your costs.

Gerrard & Co.

1958 Hawthorne Place, Melrose Park, III. (Chicago Suburb) FIBER-and-STEEL now used by

- · Cribben and Sexton Co.
- · Crown Stove Co.
- Perfection Stove Co.
- Odin Stove Co.
- Dixie Foundry
- Norge Division
- Mt. Vernon Furnace
   & Mfg. Co.

lers, hygrometers, moisture meters, hydrometers, pyrometers, recorders, recorder controllers, resistance thermometers, thermometers (all types), vacuum gages, valves, and oil testing instruments.

## Camcar announces name change; appoints new sales manager

Camcar Screw & Mfg. Corp. is the new name of a Rockford (Ill.) firm formerly known as Camcar Products Co., it has been announced by Bob Campbell, president.

It was also announced that Jim Holland, for 12 years sales manager of the Phillips Division of American Screw Company, is now sales manager for Camcar. The new appointment relieves Ray Carlson, vice president and general sales manager, of present sales duties so that he may devote more time to production management.

## **PEI Annual Meeting**

Just a reminder that the 18th annual meeting of the Porcelain Enamel Institute will be held at French Lick Spring Hotel, French Lick, Indiana, October 27 and 28.

and

effic

calc

Vai

duc

ten

of

baf

we

tha

ha

ser

str

ing

ba

M

A

in

th

pl

A

re

is

q

## Tennessee Valley ACS group to discuss porcelain enameling

The Tennessee Valley Section of the American Ceramic Society will hold a session on porcelain enameling, Friday, October 14, at the Andrew Jackson Hotel, Nashville, Tenn. Registration will begin at noon, with a plant trip in the afternoon, and a dinner at 7 o'clock, followed by a program on subjects pertaining to the enameling industry.

Plant trips will include Avco Corp., Ferro Smelting & Clay plant, and Tennessee Enamel Products.

## Florida has new porcelain enamel jobbing shop

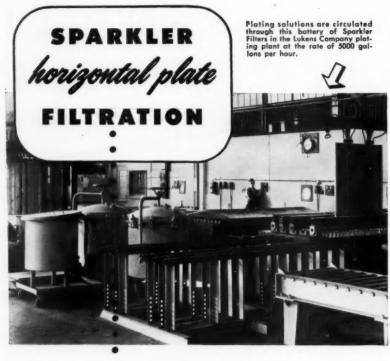
Florida Porcelain Enamel Co. is the name of a new jobbing shop scheduled to begin operation October 1. The company is affiliated with Acme Neon & Electric Co., at 840 No. Garden St., Gainesville, Florida.

Principals in the company are J. M. Dick and W. F. Zierjack, partners. Noble D. Jones is plant superintendent and Russell E. Moreland is design engineer. C. B. Heron is foreman of sheet metal fabrication.

According to Mr. Dick, the new one-box furnace enameling plant will operate as a job shop, catering especially to sign work for shops in Florida, Georgia, Alabama and Mississippi. It is also planned that porcelain enamel shower stalls will be manufactured for plumbing distributors in Florida and that porcelain enamel lighting fixtures and water heater tops will be produced.

## NESA annual convention set for Feb. 6-8, in Cincinnati

The 4th annual meeting of the National Electric Sign Association will be held at the Netherland Plaza Hotel, in Cincinnati, Ohio, February 6, 7, and 8.



for cladding steel . . . .

Lukens Steel Company, pioneer manufacturer of clad steels, has found that Sparkler Horizontal Plate Filtration is important in the production of Inconel-Clad and Stainless Clad Steel.

Here's the way it works:

Oxide film, which forms easily on the bonding surfaces of all steels, acts to prevent a strong, intimate bond between these cladding metals and backing plates. Lukens, to overcome this, applies a nickel plate finish to these bonding surfaces. In the new, modern Lukens plating plant, Sparkler filters serve as assurance that this nickel plate will be perfectly clean and free from foreign matter, thus providing the best possible surface for an inseparable bond.

The horizontal plate principle used by Sparkler makes possible the formation of firm, stable filter cakes that will not slip or crack under intermittent or continuous flow. Flow through the filter is always with gravity, and filter aid is floated into position, forming a strong cake of even thickness that effectively removes all solids and precipitates from plating solutions. Filters are pressure-tight and leakproof, and are available in rubber-lined construction, stainless steel, or iron. Capacities from 60 to 10,000 G.P.H.

Our Engineering Service is available for your specific problems.

## SPARKLER MANUFACTURING COMPANY

Mundelein, Illinois

## Porcelain enamel answers design problems . . .

→ from Page 18

of

el.

th

а

ne

nd

p

10

1.

n-

II

and they also decrease the heating efficiency by interfering with the calculated flow of the flue gasses. Variations in material thickness produce uneven expansion at elevated temperatures, and uneven radiation of the heat.

The baffle assembly is fabricated in our own plant by spot welding baffle plates to a center rod. We were at first concerned about the adherence of the finish to the areas of the welding. However, we discovered that our fears were needless. We have experienced no failures in them. We have under experiment at the present time another type of baffle construction which will not require welding. But this change is being made merely to reduce manufacturing cost.

After fabrication, the tubes and baffles are delivered to California Metal Enameling Company, Los Angeles, for finishing. CAMEO, having had considerable experience in this type of work, gives both the tube and baffles a single ground coat application. A ground coat frit is used with 20% calcined alumina Grade A-1 and standard mill additions. The resulting color is between a pearl gray and an olive drab. The color is both attractive and serviceable for our purposes.

The enameling process is standard procedure. A hot sulphuric cleaning bath is used. A heavy nickel dip is used to increase the adherence qualities. The slip is applied by dipping to about .006 inch thickness. Firing is at 1560° to 1580° F.

No special problems are encountered in the enameling process. Dipping the baffle assemblies requires some extra care in draining because of their irregular shape. Particular care is exercised in hanging the tubes on the furnace conveyors to avoid any pull which would draw them out-of-round. The tubes are hung by two hooks through small hang-hole in one end and they must be hung straight so that there is no side pull from their own weight.

The resulting surface is creamy in

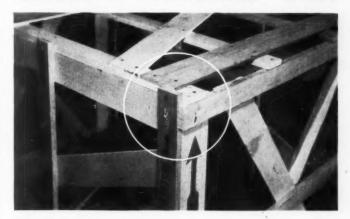
texture and is close to the "perfect" heat radiating surface. This contributes greatly to the efficiency of the heater, particularly in the amount of infra-red ray emissions. Each heating tube delivers 11,250 Btu, making the two-tube models 22,500 Btu.

We have met with no special packing and crating problems through use of the porcelain enameled heating elements. Salt spray, bend, scratch, impact, and adherence requirements have been more satisfied. Tubes have been heated to their maximum tem-

perature and then immersed in cold water without any damage to the finish.

All in all, we are pleased with the heating elements and we are certain that their efficiency and beauty will far exceed the ten years of calculated life in service. Customer satisfaction is indicated by the fact that production has jumped to 1,500 units per month in the five months since we placed the heaters on the market, and we are unable to fill the orders on hand.

# This TIGHT Hinge Corner Makes a STRONGER Crate



The exclusive "Tight Corner" Hinged Crate produced by Bigelow-Garvey offers a degree of rigidity and strength impossible in the ordinary type of collapsible crate. This one feature alone is enough to win the praise of your shipping department. Other features such as pre-drilled nail holes, completely collapsible design, and hardwood construction throughout make for ease of assembly and adequate protection.

Bigelow-Garvey has pioneered in the design and manufacture of crates for

safe shipment of porcelain enameled appliances such as stoves, washing machines, ironers, freezers, sinks, bathtubs and similar products for more than twenty-five years. You get the benefit of this experience when you bring your packaging problems to our engineers.

For domestic packaging or for export packaging in either open or completely closed crates, let us submit our ideas and prices for "safe shipment" containers.

Also PALLETS

BOX SHOOKS

BULKHEADS

Write us regarding your shipping problems.

# BIGELOW-GARVEY LUMBER CO.

General Office and Laboratory

320 West Huron Street . Chicago 10, III.

Mills • Arkansas • Georgia • Wisconsin • Minnesota • Washington